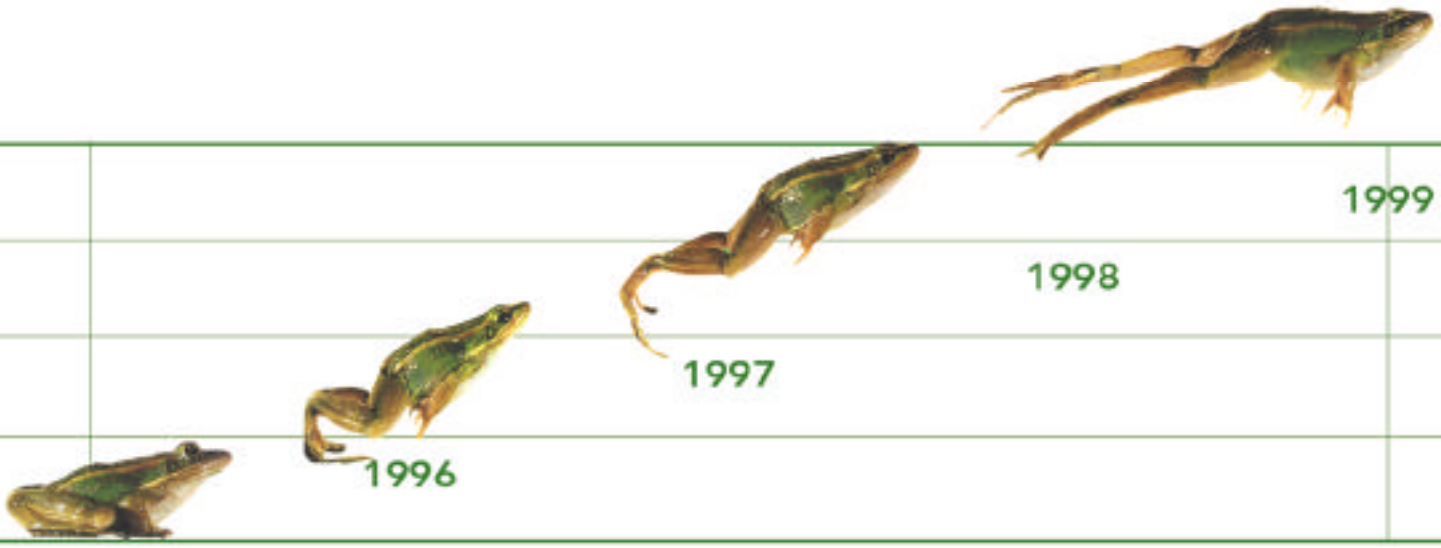
CAP

purpose
partnership
results



final report, 1999

MADAGASCAR COMMERCIAL AGRICULTURAL PROMOTION

CONTRACT N°: 623-0510-C-00-316-00 * Submitted to : USAID/MADAGASCAR * Submitted by : CHEMONICS INTERNATIONAL

This final report is submitted by
Chemonics International Inc,
&
Resource Industries Limited

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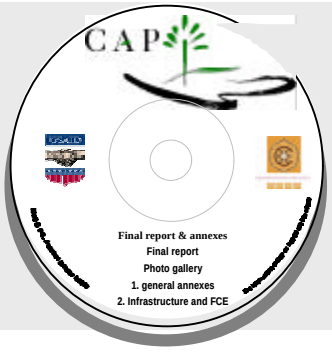


A C R O N Y M S

AEI-CAP	GRM Infrastructure implementing Agency – CAP	*Agence d'exécution Infrastructure*
ANAE		*Association Nationale pour les Actions Environnementales*
AUP	Road Users Associations	*Association des Usagers des Pistes*
BEST		*Bureau d'Expertise Sociale et de Diffusion Technique*
BNI-CL		*Bankin'ny Indostria - Crédit Lyonnais*
BTM		*Banque Nationale pour le Développement*
BFV		*Banque Nationale pour le Commerce/Société Générale*
CAE/MFE	Foreign Aid Tracking Unit - Ministry of Finance and Economy	*Cellule de suivi des Aides Extérieures*
CITE		*Centre d'Information Technique et Economique*
CJPM		*Comité Jean Pain de Madagascar*
AFD	French Development Agency	*Agence Française de Développement*
CTD		*Collectivités Territoriales Décentralisées*
EJ	Expert Junior	
EP II	Environmental Program II	*Programme Environnemental II*
ESF	Environmental Screening Form	
FCE	Fianarantsoa Côte-Est Railroad	
FENU	United Nations Equipment fund	*Fonds d'Equipement des Nations Unies*
FAMAMA	Famokarana Mahabibo Malagasy	
FID	United Nations Development Fund Project	*Fonds d'Intervention pour le Développement*
GRM	Government of Madagascar	*Gouvernement de Madagascar*
HPZ	High Potential Zone	*Zone à Haute Potentialité*
HIMO		*Haute Intensité de Main-d'oeuvre*
ISF	Input Supply Fund	*Fonds d'Approvisionnement en Intrants*
LCF	Local Currency Fund	*Fond en Monnaie Locale*
LOE	Level of Effort	
MinAGRI	Ministry of Agriculture	*Ministère de l'Agriculture*
MFE	Ministry of Finance and Economy	*Ministère des Finances et de l'Economie*
MinATV	Ministry of Land Management	*Ministère de l'Aménagement du Territoire et de la Ville*

MVN	Madagascar Vetiver Network	
NGO	Non-Governmental Organization	
PIL	Project Implementation Letter	
REG		*Régisseur (Infrastructure)*
RNCFM		*Réseau National de Chemins de Fer Malagasy*
RTL	Regional Technical Liaison (Infrastructure)	
SBM		*Société de Batelage de Manakara*
SIDEXAM		*Société d'Investissement et d'Exploitation Agricole à Mcar*
SOA.TEG		*Société d'Assistance Technique et de Gestion*
WB	World Bank	*Banque Mondiale*
WWF	World Wide Fund for Nature	

Approximate Fmg / dollar exchange rates:

1994:	2700	**1997**:	5000
1995:	4000	**1998**:	5000
1996:	4500	**1999**:	6500

Some of those who made CAP...

OVERVIEW

Overview

Origins of the CAP Project

CAP was conceived just after the end of Madagascar's Second Republic, which was characterized by a command economy. Agriculture had suffered a steady decline for over twenty years. The Third Republic brought a more liberal political and economic climate, including liberalized agricultural prices. USAID decided to increase its support to this fledgling democracy and to promote economic growth through an agribusiness project.

The USAID mission, an early supporter of reengineering concepts, chose to use a Design and Perform contracting mode for the CAP project. The RFP, issued in early 1993, called for bidders to submit a proposal to write the Project Paper and (if that design experience proved satisfactory to the mission) implement the five-year project. The mood in both the country and the mission at the time was very hopeful and there was a sense that if people worked together collaboratively, much could be accomplished, especially if the project worked directly with the private sector and did not rely extensively on central government involvement. Chemonics, too, was excited at the potential in Madagascar and our proposal emphasized a demand-driven, participative approach. We were selected and signed the design contract in July 1993.

The design team (Jim Brown, Walt Sherwin, Bob Rabatsky, Andy Dobson, Bob Haslach, and Tony Teele) built on groundwork laid by mission staff. It met with focus groups in the regions and worked closely with what eventually became the interministerial committee in Antananarivo. It also worked especially closely with project officer JohnThomas and other mission staff (Frank Martin, Jean-Paul Paddack, David Osinski, and George Carner). Tom Herlehy joined the effort a few months after it began, at first from AID/Washington and then as project officer, filling John Thomas' s position in April 1994.

George Carner, USAID mission director during the design phase, helped establish the norm of collaboration between the mission, contractor, government, and private sector.

Key Elements of the Design

The key elements that emerged from the design were:

Jim Brown, design team leader, placed an emphasis on a flexible, demand-driven approach. He also introduced the concept of having ''experts junior''placed with agribusiness clients to provide ongoing assistance to the firm and an employment opportunity to new graduates.

- An emphasis on flexibility to allow the project to evolve as needed, especially during a time of national transition.

- An agribusiness component emphasizing responsiveness to demands from agribusinesses via technical assistance from the team and a corps of Agribusiness Apprentices "experts junior ". A credit component was not included because of a sense that it would be unlikely to succeed.

- A transport infrastructure component -- despite the failure of other donors'roads programs -- because transport was such a major constraint to agricultural commercialization. Other programs had not succeeded because the government could not maintain the roads. At the time of the design, it was recognized that the users would have to participate in maintaining the roads themselves, and that the project would have to make sure they could do this, but it was not clear how this would happen.

■ The Input Supply Fund component -- actually a foreign exchange facility to address agribusinesses'lack of access to foreign exchange and as a way to use the private sector to generate local currency for the infrastructure component.

Advantages of the DAP

The advantages of the Design and Perform contracting mode became clear during the design and early implementation of the project. The DAP:

■ Allowed for a collaborative relationship to develop between the mission and contractor from the beginning. We, the mission, relevant government officials, and the private sector each developed a strong sense of ownership in the project.

■ Resulted in the recruitment of a better long-term team -- thanks to our special sense of ownership and commitment to the project, the extra time we had to interview candidates, the certainty we could offer candidates that we would be implementing the project, and the mission' s demanding yet collaborative involvement in the process.

■ Allowed for a more efficient start-up. The contracting officer allowed a four-month bridge period between the design and implementation. During this time, we found offices and houses, ordered the vehicles, and began recruitment of the local team.

Evolution of the Design during Implementation

In September 1994, Chemonics'contract was modified to include the implementation phase. Mark Heim and Martine Catry had already been on board for about four months. The rest of the long-term expatriate team (Criss Juliard, Andy Dobson, Jean-Robert Estime, and H Schar) joined them within two weeks. Vero Razafintsalama was hired as infrastructure director, completing the senior staff. Over the course of the next five years, we carried out the project as designed, with the following adjustments:

■ The Input Supply Fund incorporated a six-month deffered payment provision. This change was necessary because liberalization of the exchange rate just after completion of the design eliminated the original constraint that the fund was supposed to address.

■ Chemonics took on supervision of road construction firms directly, rather than subcontracting this function to a management engineering firm. This change was necessary because local firms'bids for this work came in higher than expected and it was determined that the work could be done more cheaply in house. As it turned out, internal management of this function reduced the normal time gap between design and construction, helped the core team gain a better understanding of on-site situations, allowed them to respond more effectively to both problems and targets of opportunity, and facilitated integration of rehabilitation and maintenance activities.

■ It was harder to find " winners " in the agribusiness sector than we thought. In its start-up workshop, the long-term team agreed that they would spend most of their effort on winners, to assure the greatest economic impact. However, lack of entrepreneurial skills and sound business practices turned out to be widespread. We ended up spending more time building clients'management capacity than we had expected. Lack of access to credit was also a constraint, which was resolved in part by developing an in-house capacity to assist clients with business planning, loan preparation, and follow-up with financing institutions.

■ Although the original project design specifically precluded work with state-owned enterprises, we came to realize that these enterprises needed some help to prepare

Tom Herlehy, CAP's first project officer, was both demanding and supportive. He stressed open communication and established the practice of weekly meetings with detailed agendas that always began with some piece of good news.

them for privatization. We provided significant assistance to three state enterprises, a rice mill, cashew plant and the Fianarantsoa-Cote Est railroad. The project design had envisioned possible involvement in the railway, under the aegis of the transport infrastructure component, but had not envisioned a major effort to strengthen its management and ready it for privatization.

■ The expert junior program ended up recruiting people with more years of experience. The original concept involved hiring recent graduates, but as it turned out, agribusinesses and associations often wanted people with at least a couple of years'experience. In addition, the expert junior program required more time of project staff to plan the work, train, and technically support junior experts than originally planned.

■ Building road users'capacity to maintain the roads turned out to be a major project component. In addition, the project supported some road user associations not only to maintain the roads but also to get access to agricultural inputs, increase production, and better protect the environment.

■ Downsizing of the mission's portfolio caused the CAP project to be moved from the economic growth program to the environmental program. This change had the advantage of causing the "greening of CAP," i.e., allowing us to work at the nexus of development and sustainable use of natural resources.

■ The credibility of the CAP team allowed us to attract over $4 million in road rehabilitation funding from other donors. This funding helped make up for part of the reduction in funds caused by the mission's budget cut.

■ Erosion along roadways and watersheds turned out to be a major problem. Erosion increased the amount of cement work needed, forced us to redo some sections of road, and made maintenance much harder for road user associations. These problems led us to develop a bio-engineering solution using vetiver grass technology. Production of vetiver and wide diffusion of this technology became a major project activity in the final two years of the project.

Major Achievements of the Project

The major achievements, described in the following chapters were:

Helen Gunther oversaws CAP from 1994-1999. Her clear thinking and guidance helped us maneuver through complex government procedures and establish good liaison with donors who contributed $4 million in funding to the road rehabilita - tion.

■ More commercially oriented agribusinesses. About 16 clients achieved major benefits from their work with the project (e.g., Rovel, Deux Freres Junior, and the Ferme d'Ambalabe. Another 29 achieved some significant benefit. Successful clients include enterprises and associations that:

-- Began, expanded or improved production of alternative crops (off-season vegetables, essential oils).

-- Began or expanded production of organic products (organic tea, spices, fertilizers)

-- Began or expanded processing activities (rice milling, fruit drying, composting)

-- Developed nurseries (21 enterprises planting vetiver, cof fee, and flowers)

-- Significantly improved their internal management (34 enterprises and associations using improved accounting systems, learning better financial management, learning to use computers, using internet)

-- Improved distribution (association of milk producers, far mers'gazette, honey, dried fruit)

-- Tapped new markets (onions to La Reunion, dried man goes to Mauritius, essential oils via the internet)

Vero Razafintsalama managed the $13 million road program that has earned CAPnation-wide acclaim. She combined dedication and integrity with an ability to patiently and creatively find solutions to complicated technical, management, and bureaucratic problems.

-- Were able to obtain loans for new investments (22 companies obtain loans of about 7.4 million Fmg or $1.5 million).

■ Design and implementation of the sale of the cashew processing plant to a private Malagasy company, the country's first privatization under the new privatization law.

■ The equivalent of 460 km of rehabilitated roads.

■ A framework for devolving responsibility for road maintenance from the central and local government to private road user associations.

■ The creation and development of 56 road user associations.

■ A system of toll collection to help fund maintenance of rehabilitated roads. Additionally, the involvement of the private sector and local government in the funding of road maintenance.

■ Diffusion of vetiver grass technology as a way to control soil erosion and increase soil fertility.

■ Design and implementation of the sale of the cashew processing plant to a private Malagasy company, the country's first privatization under the new privatization law.

■ Completion of a pilot program to strengthen and partially rehabilitate the FCE railroad. In-kind fundraising amounting to $600,000 worth of donated equipment. Groundwork laid for privatization.

Why We Were Able to Achieve Results

USAID/Madagascar put its first priority on furthering achievement of results more than being Aapproval-oriented

Among the factors that contributed to CAP's success were the flexible design, good recruitment, an adaptive management style, and the collaborative relationship with the mission as mentioned above. In addition, the project addressed important concerns of beneficiaries. CAP articulated a vision and offered a tangible benefit (e.g., road rehabilitation) that people cared about. We defined what was strategic, but applied that definition flexibly, going after targets of opportunity and juggling many activities at once. We looked for solutions with the beneficiaries and tailored solutions to each region and each association rather than following a recipe for development. We were willing to take risks and sought out others who were committed to results and high performance. We found that many people were interested in improving their lives, but did not always have the confidence, skills or vision to move forward. The team worked in a spirit of partnership. CAP worked with people in a way that showed respect, offered encouragement, and provided a model for problem solving. In some ways, we were simply an encouraging presence to many who would otherwise be forgotten. Often, we tried to catalyze and provide a model for problem solving by bringing people together and working with them. As one of our staff said, "our working alongside beneficiaries helped increase their confidence as well as their skills." Finally, we loved our work.

USAID/Madagascar put its first priority on furthering achievment of results more than being approval-oriented

They made CAP, too...

RESULTS

Agribusiness Support:

Building a More Commercially-Oriented Agribusiness Sector

CAP worked with 164 agribusiness clients. Almost all of our clients increased their technical or managerial capacity in some way and are now better prepared to compete in regional, national, or international markets. While it is difficult to measure the success of such a diverse group of companies receiving a variety of types of support, we estimate that about 16 clients were profoundly influenced by our assistance and have totally transformed some core aspect of their business. The clearest example of this is the cashew plant, which was privatized. Another 29 clients have made some significant change in the way they do business. In 1998, the most recent year for which figures are available, our 30 most successful clients increased their sales by almost $3 million (compared to the target in our contract of a $680,000 increase in sales). Of those clients who received assistance preparing loan applications, 22 received $1.5 million of loans to carry out various investment projects; the increased sales and profits from those investments will occur in the next few years.

Onion production and export. *CAP helped the SOCTAM expand into the production of onions and export 350 tons to La Reunion. A CAP consultant introduced a new onion variety, the Veronique, and two experts juniors trained producers in improved techniques. Sales amounted to $ 157,000.*

CAP made a significant or very significant difference to 45 out of 164 clients.

214 Client Service Plans

CAP used a demand-driven approach that was designed to increase our chances of working with businesses that were most likely to succeed. Our COP, regional directors, and local agribusiness specialists (mainly Alain-Pierre Randrianjohary, Jacques Ravelonahina, Guy-Robert Rabeanivony) offered a menu of technical services, but assistance to each client was custom-tailored as outlined in the Client Service Plan. We prepared 214 Client Service Plans over five years. Types of work fell into the following categories:

- Technical support: studies, advice, information research.
- Management training
- Marketing assistance
- Expert Junior assistance

Leveraging Resources with Junior Experts and Consultants

We leveraged the efforts of our long-term agribusiness team with 37 experts junior and 28 short-term consultants.

Agribusiness Apprentices.

The expert junior program was a cost-sharing program that allowed clients to hire young graduates, or in some cases more senior advisors, for a year. A local consulting firm, SOA.TEG, helped CAP manage this program. 37 experts junior were placed with 27 clients. These arrangements benefitted both parties. On one hand, the enterprises were able to:

- Diversify their production (into onions, green beans)

30 clients increased sales by about $3 million.

- Promote new products (dried fruit)
- Provide extension services to farmers (for wheat, geraniums)
- Carry out research
- Carry out varietal trials and trials of new production techniques (for rice)
- Market more products (agricultural inputs, milk)
- Manage and maintain processing operations (palm oil, dried fruits)
- Protect the environment (planting vétiver).

On the other hand, the experts junior were able to find work, even though many had just received their degrees.

Local and Expatriate Consultants.

CAP was able to benefit from the services of 15 local consultants and 13 expatriate consultants to carry out 23 studies. Topics ranged from various agricultural sub-sectors (litchee, tree crops, coffee, milk, wine, tea, essential oils, production of agricultural materials), to privatization, processing, the environment and ecotourism (see list in annex). The studies led to, inter alia, establishment of a small rice mill, the privatization of FAMAMA, partial rehabilitation of the railroad, some improvements of the port, and development of ecotourism in Ambositra. The fact that some of our clients were financially weak, combined with difficulties in getting bank loans, prevented them from undertaking some investments despite the promise of many filieres that we and our clients investigated.

22 CAP clients received loans totalling of $1.5 million from local institutions.

Preparation of Loan Applications

Twenty-five percent of requests for CAP assistance relate to investment studies and preparation of loan applications. In all, 41 applications were prepared, for a total of 10 billion Fmg (about $2 million). Twnety-four applications, for a total of 7.4 million Fmg, were approved (see annex). Amounts and sources of financing were as follows:

- 82%: International organizations (FENU, PRO PARCO, EAM, CI)
- 14%: Local banks (BNI, BFV, BTM)
- 3%: Other local financial institutions (FID, FIARO, Fondation Tany Meva)
- 1% Private enterprises (AFAFI, KOBAMA, AQUALMA)

Investment projects dealt mostly with:

- Expanding the production and processing of agricultural products
- Ecotourism
- Environmental protection

Training

CAP carried out 39 training sessions, which were attended by 1000 people. Seventeen percent were women. Subjects included:

- Road maintenance techniques
- Administrative management, accounting, and finance
- Environmental protection
- Organic crop production
- Savings and credit management

Impacts from training include the expansion of processing operations (milk, dried fruit), increases in the production of high value-added crops (geranium and essential oils), how to access credit (for a small consulting firm, technical training college, and various NGOs), and skill building for road user association members and road barrier guards.

Productive Partnerships

CAP initiated and worked in partnerships to diffuse agricultural practices, protect the environment, and increase farming family revenues. Memorandums Of Understanding and partnership agreements were established and signed with 15 development partners (see list on next page).

Eddy Rasoanaivo was among the earliest technical staff to be hired. He was CAP's financial analyst responsible for preparing funding requests for clients. Later in the project he became manager of the ambitious FCE Railroad rehabilitation program. (see section on Railroad and Port).

Productive Partnerships

Partner	Activity
Comité Jean Pain de Madagascar	The Comité Jean Pain de Madagascar, along with l'ONG Tafita, Tanety Soa Miray de la Coopération Suisse, Tany Lonaka, and CAP published and distributed the farmer gazette (Fanoitsa) and diffused organic fertilizer techniques using Bois Raméaux Fragmentés (BRF)
NGO Voahary Soa	Vetiver production for road user associations
The World Bank and the PPI program	Protection of the watershed and water source for irrigation of the Ambalabe Bekobay plain. The PPI program is to rehabilitate a dam.
Tany Meva Foundation	Funding the purchase of 2.4 linear km of vetiver to protect the Bekobay road.
PNVA/FITAFA/KOBAMA	Off-season wheat production, which benefited 33 producer groups in Ambositra. KOBAMA recovered 85% of its input loans, PNVA diffused production techniques. CAPprovided an expert junior to train farmers.
United Nations Equipment Fund	CAP carried out feasibility studies for vetiver along the RIP104 between Andranofasika and Ambato Boeni.
Conservation International	The VONONA women's association of Andranofasika produced dried fruits and jams thanks to the financial support of CI and the technical support of CAP, which provided experts juniors and training on the management of a drying unit and marketing of the final product.
Silo National des Graines Forestières	The National Forest Seed Bank and CAP developed a technical information sheet on vetiver, which will be distributed to their clients.
Peace Corps	CAP trained Peace Corps volunteers in agriculture techniques to reduce environmental pressures.
Fonds d'Interventions pour le Développement.	The FID financed rice mills in the Morovoay and Bealanana regions in areas where CAP financed roads. CAP and FID trained three training groups in Ambositra to supervise groups interested in revenue generating activities. TheVonona Association provided financial services to three groups doing off-season production resulting in 8 million Fmg in credit from FID.
WWF Andringitra	WWF and CAP carried out an environmental impact study of the 46-km road linking Ambalavao and Namoly, on the edge of Andringitra National Park. WWF spent 600 millions Fmg to rehabilitate 19 additional km inside the park and CAPcarried out the study and technical supervision of the work.
IRRI/FOFIFA	CAP undertook trials on improved rice production techniques in Bekobay and Bealanana. Three experts junior worked full time on varieties supplied by FOFIFA and IRRI.
Westtown-Goshen Pennsylvania Rotary Club	Donated $2000 for the purchase of vetiver plants and for vetiver training. It also financed the NGO "Madagascar Vétiver Network."
Vétiver Grass Network	The worldwide network awarded a grant and prize to the project for having promoted vetiver production for environmental protection and protection of rural infrastructure.
Association Nationale pour les Actions Environnementales	Collaborated with CAP in vetiver promotion.

Privatization

The FAMAMA privatization was concluded in January 1999, when FAMAMA became the country's first privatization under the new privatization law. The company was sold to Must, part of the Malagasy-owned and operated Toyota Rasseta group, for 4.2 billion Fmg ($800,000).

FAMAMA, located in Mahajanga, is a cashew processing plant that has generally operated at less than a tenth of its 3000-ton per year capacity since it was built in 1987 with the help of a $4 million loan from the African Development Bank. FAMAMA became a CAP client in 1995 when we were asked by its board to provide a blueprint to make it profitable. Our long-term proposal was to privatize the firm. When the new privatization law was passed, FAMAMA was on the list of the first 46 companies to be sold and CAP became the technical agent for the privatization.

CAP assigned Jean-Luc Aldorf as coordinator, two international privatization specialists (Nelson Edwards and Jim Brown), and eight local technicians and legal specialists to the process. CAP recommended a strategy, had it accepted by the various government entities concerned, and prepared lengthy bid documents. We evaluated the offers and helped with the final negotiations.

One of the main challenges was to structure the privatization in a way that avoided potentially crippling land tenure problems. The decision was to sell only the factory and equipment, not the land. Must is now looking into possibly buying various pieces of land around the factory and one or two plantations.
Another issue was a potential labor problem, but only 30 employees are expected to lose their jobs -- they are administrative employees. Must is also planning to hire from 100 to 250 factory workers, depending on how many shifts they need.

The Country's First Privatization under the New Law
CAP's focused approach allowed the sale of the FAMAMA cashew processing plant in less than a year. We expect sales of the privatized plant to increase by $3 million a year.

According to our projections, the plant will be profitable within a year. They are already beginning to streamline their operations and institute a more business like ethic. One of their major constraints is raw materials supply, but RASSETA has extensive experience sourcing raw materials (including cashews) in Madagascar. In addition, LDI will be investigating an improved variety and helping small farmers plant cashews trees.

This privatization has helped put a potentially profitable asset back into full operation. The fact that the firm was sold to a Malagasy investor has symbolic importance. It is also an accomplishment to have completed what could have been a very long and drawn out process in less than a year (and within ten days of the deadline).

BEST PRACTICES

■ There is a delicate balance between providing enough support to a client and taking on too much of the work for him. We found that clients needed a lot of help, especially in mounting ambitious projects. At the same time, some of these projects failed, despite a lot of assistance from CAP, and other projects that received critical but less massive support succeeded. The Expert Junior program could be used as a model to provide low-cost on-going technical and managerial assistance to agribusinesses and associations. Experts junior were involved in many of CAP's clients who turned out to be successful or highly successful.

■ Workshops were a good way to stimulate creation of conservation-based enterprises such as fruit drying and essential oil production. They were also an efficient way to introduce groups of people to key concepts related to soil conservation and international marketing.

■ Synergies can be achieved in pairing long-term team members and short-term consultants. Long-termers know the environment and the client, can develop appropriate terms of reference, can orient the short-termer, and follow up. Short-termers can bring specialized expertise and fresh perspectives. Fruitful team-consultant collaborations under the CAP agribusiness component resulted in a new rice mill and contributed to the privatization of the cashew processing plant.

CAP provided processing and marketing assistance to ROVEL Milk Producer Association (Fianarantsoa) that led in three years to a ten increase in sales and distribution points.

■ Establishing close professional ties with the major financial institutions and their loan officers allowed financial institutions to learn more about our clients and be willing to work with them.

Rural Roads:

Road Improvements and a Replicable Model for Maintenance

The objective of CAP's infrastructure component was to facilitate the movement of agricultural products between production and marketing centers. The component took on an unexpected importance during the project for several reasons. Even before the implementation team arrived, government representatives on the project management committee asked CAP to speed up the schedule for road rehabilitation because rural populations so badly wanted better roads. During the course of the project, both rehabilitation and maintenance component posed many difficult challenges, but we were able to find solutions, some of which were quite innovative and which addressed problems that others had been struggling with for years. In this way, the CAPproject developed a distinctive capability and a positive image.

Road selection was made at the regional level. Rehabilitated roads are managed at the local level

The Infrastructure Team during one of its planning session. Timing is always a critical element since each annual road rehabilitation program was impacted by funding cycles, weather conditions, and complex contracting mechanisms.

Road Selection

Seven fivondronana were the beneficiaries of 460km of rehabilitated roads (See maps in the annex):

- In Fianarantsoa: Ambalavao, Fianarantsoa II, Ikongo, Manakara
- In Mahajanga: Bealanana, Mahajanga II and Marovoay

These roads were selected by a multi-step process. Rural communities made requests and project engineers did a preliminary feasibility study. Then the requests were presented the Regional Infrastructure Committees in each province, comprised of representatives from regional technical services (Topographique, Domaine, Agriculture, Travaux Publics) and local authorities. This group reviewed and ranked the requests. Then members of the project management committee (representatives of the Ministries of Finance, Commerce, and Aménagement du Territoire, prioritized the requests according to the expected returns from the roads and selected those that fit the available budget.

Out of the approximately 1,900 km of roads requested at the regional level, 660 km were accepted by the regional infrastructure committees and 460 km were approved by the project management committee. CAP's technical staff carried out feasibility studies, followed by technical studies (Avant Projets Détaillés), on all requests approved by the regional committees.

Other Donors Joined Our Initiative

Our initial target of 700 km of roads using $16 million from the Input Supply Fund was reduced, due to a USAID budget cut, to 387 km using $8.5 million in ISF funding. However, given the contribution of three other donors, CAP was able to rehabilitate the equivalent of 460 km of roads. The donors included:

- European Union : 6 billion Fmg ($1.2 million)
- Japanese : 9.5 billion Fmg ($1.9 million)
- WWF : 600 million Fmg ($120,000)

Quantifying What Went into the Work

For the record, it may be interesting to note that most, but not all of USAID's contribution to the roads came

from the local currency fund, which received its funds from ISF transactions. In early 1995, CAP decided to start the roads component quickly without waiting for the ISF to generate local currency. A direct transfer was necessary. We used 1.7 billion Fmg (approximately $500,000) of PL 480 funds and 6.6 billion Fmg ($1.6 million) of FARA, as recorded in PIL #11.

Rehabilitation of the roads meant that the CAP team:

- Mobilized more than 58 billion Fmg of funding (roughly $12 million) from USAID and other donors.
- Signed more than 80 construction contracts.
- Cancelled 7 contracts.
- Worked with 59 construction companies, of which 55 were small or medium sized businesses.
- Mobilized 45 engineers and site supervisors, 10 socio-organizers, 7 site vehicles, 20 motorcycles, and 6 mountain bikes.
- Carried out 400 on-site construction progress mee tings (réunions de chantier)
- Processed 600 payment installments.
- Consumed more than two reams of paper per day to produce copies of all of the contracts, modifica tions, and payments, as required by law.

We rehabilitated the equivalent of 460 km of roads. (In our kilometer equivalency calculation, a bridge counts as a certain number of kilometers of road. The conversion is done by dividing t he cost of the bridge by the average per km cost of a road.) Included in the 460 km is a 92-meter reinforced concrete bridge and roads divided into five programs: 1995, 1996, 1997, 1998, and 1999 (see detailed table in CD ROM annexe, Infrastructure section)

The infrastructure unit established 56 road user associations and oversaw the work of 59 construction firms

The unit cost for our work generally ranged between $13,000 and $40,000 per kilometer, although some more complex and difficult sections cost $60,000 per km. The least expensive sections were in Fianarantsoa, the most expensive in Bealanana. The major factors affecting the cost were:

The CAP infrastruc - ture team worked clo - sely with our ministry counterpart Ngolo Gilbert. A good deal of our success is due to the effectiveness of this partnership

- The state of degradation of the road to start with
- The terrain and soil conditions
- The number of culverts, bridges, and other civil works required
- Isolation of the site
- Whether the road was a secondary or tertiary road

We found that vetiver was a cost effective investment to protect expensive civil works. Depending on the amount of cement work on a given road, vetiver protection costs 1-3% of the value of the initial capital costs. Ongoing and periodic maintenance by user associations is 500,000-1,600,000 Fmg ($100-300) per km, again depending on the nature of the terrain and soils, the traffic, and the climate.

Transfers of Responsibility and Management

To assure that roads lasted a full five-year life, CAP initiated development of a new legal framework for road

This is a «Sonnette», a four meter structure used to sink pillars into the ground as footings to stabilize access ramps. Most ramps require 20 to 30 sunken pillars. Each pillar can take up to 2-3 days to sink at a depth of 3-5 meters. At Bealanana alone, 520 pillars were sunk as footing for radiers and ramps near river banks.

maintenace. This framework involves a multi-step process of devolving responsibility, called in French the transfert de compétence and transfert de gérance. Thanks to the cooperation of reform-minded individuals at several layers of government, the two provinces (the Faritany of Mahajanga et Fianarantsoa) transferred responsibility for maintenance of CAP roads to the communes (this process was called a transfert de compétence) and in another transfer, the communes signed management contracts (contrats de gérance) with the road user associations created by CAP. All in all:

- The two provinces carried out 10 transferts de compétence to the communes.
- The communes carried out 22 transferts de gérance to 56 associations.

This was a big first in Madagascar. The associations were created thanks to close collaboration between our staff, beneficiaries, and traditional authorities. These associations, known in French as Associations des Usagers des Pistes or AUP, are comprised of private entities (transporters, collectors, private companies working in the area), the population along the road, and local authorities (both from Communes and Fivondronana). The Malagasy consulting firm BEST and the team's socio-organizers provided significant technical and moral support for the creation of the AUPs, helping draft their official constitutions, providing training in organizational skills/planning/budgeting, and guiding them in their relations with local authorities.

"The concept of road user associations and toll collection allowed CAP to break the cycle of dependence on the national government to repair rural roads" Best Practices Report, USAID, 1999

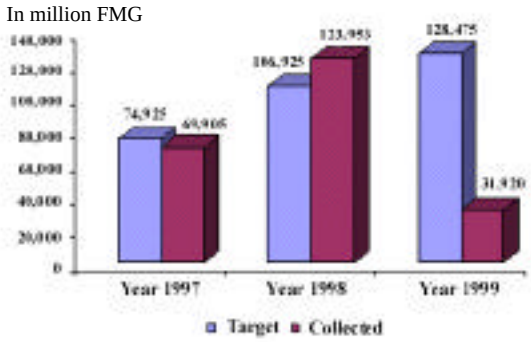
Advantages and Constraints of Our Procedures

A procedures manual was developed, which stipulated steps to be followed during rehabilitation. CAP had the authority to handle contracting according to standard scopes of work developed by the Malagasy government and USAID. CAP had regional advance accounts (caisses d'avance), managed by regional registrars (régisseurs).

These arrangements allowed construction companies to be paid as soon as their invoices (décomptes) were verified.

On the other hand, the annual process for requesting funds under the Programme d'Investissement Public or PIP and the slowness of the PIP approval process caused serious delays in the progress of the work. Sometimes work had to be cancelled or postponed until the next year even when local currency funds were available in the CAP

Funds Collected by AUPs for road maintenance



The success of the CAPmodel hinges whetherassociations will be able to raise the $100-$300/km required formaintenance, Indications are positive so far.

1998 data are as of May 1999 for Fianarantsoa and as of March 1999 for Mahajanga. This figure will be completed in the addendum to thid report, which will be submitted in December 1999.

Road User Associations (AUPs) were a new institution established by CAP. Meetings required members to participate, nominate, vote, establishe annual work plans, budgets, and set annual contributions from members. 56 AUPs are opera - tionnel in the areas where CAP rehabilitated roads. The model is now beeing replicated in other parts of Madagascar and Africa.

account at the Central Bank. These delays caused confusion, extra work, and cost increases.

Beneficiaries were Hesitant in the Beginning

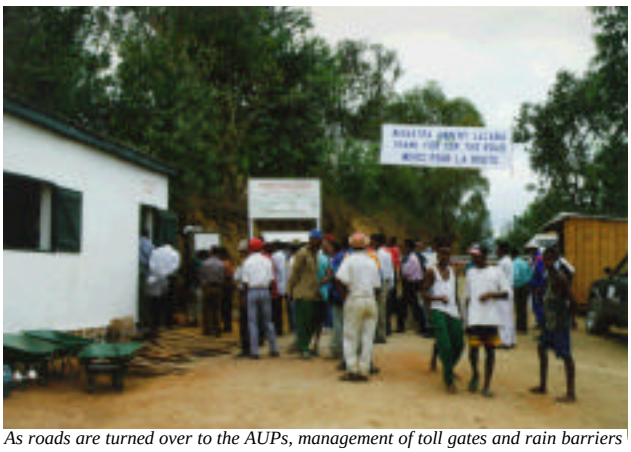
Associations are made up of mainly uneducated small farmers who lead isolated lives and who are not used to taking on new responsibilities. To overcome their hesitation and to base our approach on their needs, we did not follow a cookie-cutter approach to the design of our road maintenance work. First, we got general agreement from major stakeholders that local users should be responsible for maintenance. Then we involved each group of beneficiaries in identifying how this would work in their area. Each association, in collaboration with CAP socio-organizers, made its own decisions regarding:

- How to raise money
- The amounts of tolls to be paid by vehicles of various categories
- How to install rain and toll barriers and get people to respect them
- How to get local authorities to regularly contribute to the maintenance fund

For the first time in Madagascar, in April 1997, some public infrastructure was transferred to private management.

AUPs'skills and confidence increased thanks to the on-site support of socio-organizers, to institutional strengthening, and to technical training provided through our training programs (chantiers écoles). The CAP staff developed an illustrated and easy to follow maintenance manual to serve as a guide for road crews and associations for ongoing and periodic maintenance.

To get the most from the road, neighboring communes combine efforts and resources to carry out fundraising and maintenance. This taking of responsibility by the beneficiaries has changed their mentality of isolation.



As roads are turned over to the AUPs, management of toll gates and rain barriers is handled by paid employees of the Association. At each toll, there is a facility to house the employee and a safe place to keep tolls (see house at left)

Assuring Funding for Road Maintenance

Thanks to solutions identified with the users. They are now able to access maintenance funds through several sources. Associations vary in how much money they get from different sources, but on average, sources are:

- 61% from tolls
- 26% from local authorities (communes, Fivondronana, and Faritany)
- 4% from the private sector (contributions, additio nal taxes)

Local authority means the right to close the road at the time of rain and the right to collect tolls from users. These two factors help the sustainability of USAID's investment.

- 7% from membership dues
- 2% from fundraising events.

In 1997, AUPs collected 93 % of their maintenance budget. In 1998, they collected 92 % and in 1999, 26% (as of May 1999 for Fianarantsoa and as of March 1999 for Mahajanga).

With Tolls, Maintenance Costs are Borne by Those Who Benefit

Since users pay tolls regularly, they demand that the road be in good condition each time they use it. This is an efficient way of supervising the condition of the road.

Traffic has increased on each road rehabilitated by CAP. (See annex for details.) New bush taxi lines have been created and have begun regular service. Trucks carrying local produce transport it to local or more distant markets.

Accountability to Local Authorities

All associations must report to local authorities on the work they have carried out and on their annual finances. Their work plans must be approved by the commune's oversight committee (Conseillers Communaux) and this group decides how much the commune will contribute to the association's budget. So far, communes have elected to pay annually between 2-6 million Fmg ($400-$1200) or 26% of associations'budgets.

The Infrastructure Team Represented a Broad Spectrum of Talent

Vero Razafintsalama directed the Division's permanent staff and some 34 part- time civil and rural enegineers, roads supervisors, designers and construction specialists. She provided world-class management, technical and negotiation skills during her five years with the project.

She and her deputy Jean Claude Razanamparany, who brought to CAP his experience with the Swiss road program, were assisted in each region by head engineers Zo Pascal Rakotoarivelo and Verosoa Mamy Raharivelo. Each of the construction sites had a site engineer and a supervisory engineer as well as a crew from the National Public Works Testing Laboratory who continually tested construction for compactness, quality of surface material, and cement curing.

Much of the AUP's sucess is due to socio-organisateurs like Grégoire Rabenja, above, who worked with members to help them develop a vision of how they could manage the road, and then develop the skills and confidence to do it.

CAP Experiences Carried on by Others

The CAP model has been cited by the World Bank in its publications and at conferences. It has been adopted by the Bank and other donors into the design of their own road programs.

"Perhaps the most significant best practice revealed from conducting over 34 interviews with stakeholders of the project, was the sense of ownership over their destiny and the ensuing dignity that follows from the accountability for the future of their rural roads. [And] the sense of pride and integrity captured by their own ability to manage and maintain roads that are the arteries to their livelihood."
Best Practices Report, USAID, 1999

At the same time, CAP realizes that the road user associations need more support before they are fully sustainable on their own. Given that construction contractors are responsible for road maintenance for a year after the rehabilitation is complete, some associations are just beginning to take

"Management transfert (of roads) is not the end in itself, but the beginning of the civil society participation."
Best Practices Report, USAID, 1999

At each toll gate, the rate by size of vehicle is clearly marked. Rates vary from AUP to AUP, but on average, tolls amount to about 60% of association revenues.

over maintenance responsibilities this year.

To give the associations the best possible chance of succeeding, USAID has agreed to provide technical and organizational support to each association for the first three years that it is responsible for maintenance.

This support will be provided by the same staff, contracted via the LDI contract. The intention is to give full support the first year, and then diminishing levels in the following two years.

Given their commitment to the CAP model and their sense that many other donors are interested in replicating the CAP approach, the CAP infrastructure team has formed an NGO in order to continue using their technical and organizational skills.

This NGO is called Lalana. LDI will employ them to follow up with road associations and they hope to find work with other donors who plan to use the CAP model such as CARE, WWF, the Livestock Program, ANGAP, and the European Union.

This is a famous bridge! It is the bridge of Maroany which was entirely rehabilitated by 7 communities of Lokomby as part of their annual maintenance program. It was entirely funded by them and built after CAP had concluded work on the road. It is an indication that the AUPs on their own have the capacity to conduct maintenance work.

Perhaps the most significant best practice revealed from conducting over 34 interviews with stakeholders of the project, was the sense of ownership over their destiny and the ensuing dignity that follows from the accountability for the future of their rural roads [and] the sense of pride and integrity captured by their own ability to manage and maintain roads that are the arteries to their livelihood.

Best Practices Report, USAID, 1999

BEST PRACTICES

■ When undertaking a complex activity with lots of uncertainties, it is important to build a team that is open to learning -- learning from others, learning from mistakes, experimenting with new methods and technologies.

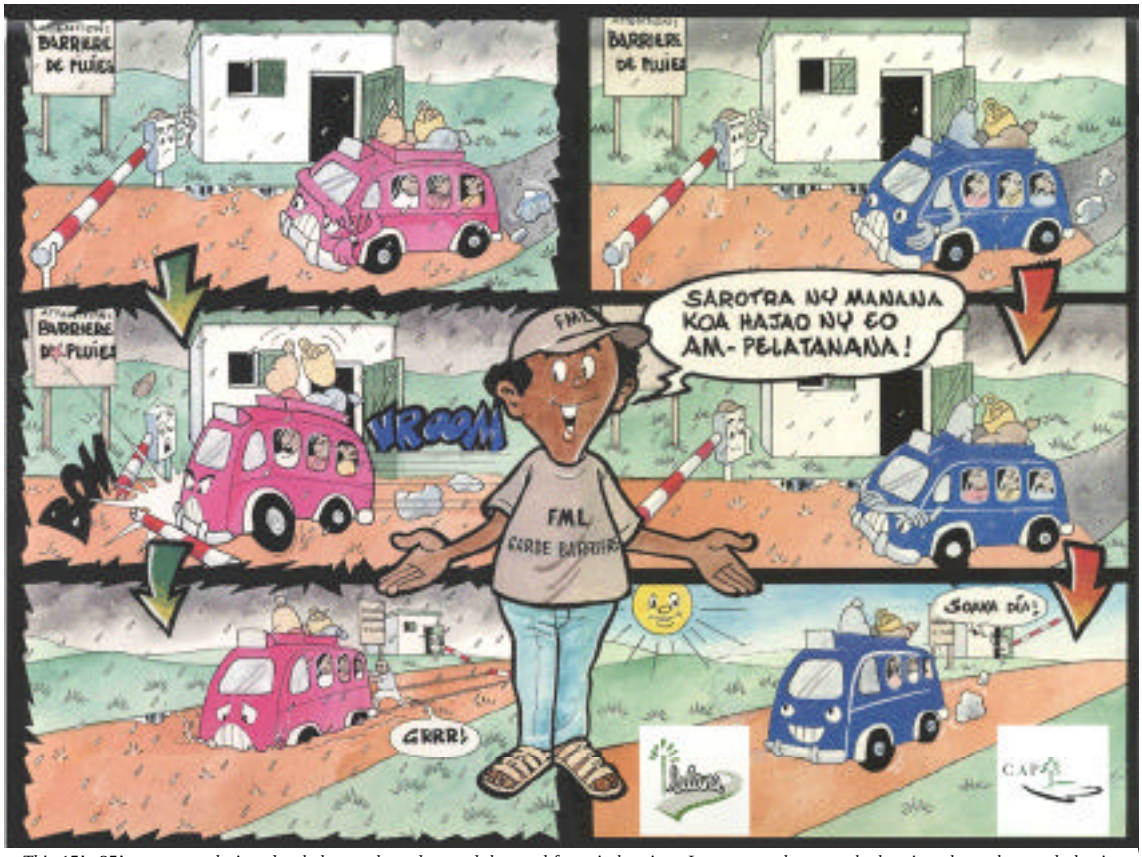
■ The CAP model shows that the participative approach works. Small farmers, local officials, and private business were able to come together and cooperate to achieve a common goal of road rehabilitation because it offered them all tangible benefits.

This cooperation was a good way to catalyze rural development. Where CAP has made investments, others have joined in and a multiplier effect is beginning to take effect.
For example, the Japanese are planning to rehabilitate a secondary road between Ikongo and Ifanadiana, near where CAP has rehabilitated a tertiary road and bridge and where we are working on the railroad, specifically because they have seen that we worked successfully in this area.

■ The key elements of the CAP approach are:

-- use of a private firm as the general contractor (maître d'ouvrage)
-- local participation in the selection of roads to be rehabilitated-
-- formation of road user associations
-- devolution of responsibility and management through the transfert de gérance
-- use of rain barriers and tolls.

It was useful to involve the police (la gendarmerie) to train association members in the enforcement of regulations. The training helped increase associations'skills and confidence.



This 15'x 25'poster was designed to help people understand the need for rain barriers. It was posted next to the barriers themselves and also in public places, like markets & administrative buildings in the villages.

Environment:

Technologies for Sustainable Resource Management

CAP used various tools and technologies to assure that its economic development activities are both environmentally friendly and contribute to the rebuilding of damaged soil and land.
We carried out environmental impact assessments, tested and diffused vetiver grass technology, and promoted various soil-friendly products (e.g., essential oils, organic composting).
We encouraged the private sector to support activities to protect natural resources and think of themselves as stewards of the environment.
We carried out studies to better understand the linkages between agriculture and the environment.

Although in the beginning of the project, our environmental activities -- environmental impact studies of our roads, for example -- were a fairly small part of our effort, they grew as time went on.
In 1996, as required by MECIE decree from the ONE, CAP staff received training from the KEPEM project in environmental assessment and began to carry out environmental assessments of our agribusiness clients'investment projects.
Finally, in 1997, we established a separate environmental component to create more explicit and significant linkages between the CAP's development activities (agribusiness support and infrastructure rehabilitation) and environmental protection.

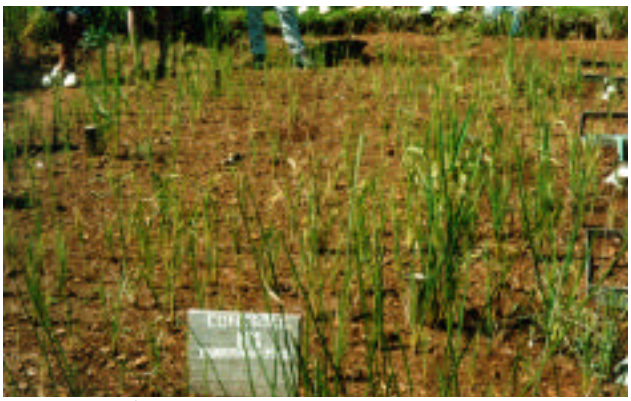
Environmental impact assessments

CAP carried out environmental studies of all of road and railroad work, and sensitized both its agribusiness clients and road construction companies to need to minimize negative impacts of their activities on the environment.

■ Agribusinesses. CAP carried out impact assessments for all new investments. Each of these 24 studies included recommendations for mitigating environmental effects. In general, our agricultural production activities had a minimal negative effect on the environment, mainly because we emphasized organic composting rather than chemical

fertilizer. Processing activities, on the other hand, involved employees'exposure to chemicals and toxic waste from processing plants. We identified and recommended ways to deal with toxic liquids, smoke, dust, and rice husks. Thanks to our recommendations, clients have used rice husks for brickettes and for the rehabilitation of a soccer field, correctly stored their stocks of chemicals, and better protected their employees who handle toxic products.

■ Infrastructure. All roads rehabilitated by CAP had USAID-approved environmental impact studies before



These pictures, from a GTZ experimental plot, show green manure can increase rice yields. The control plot on the left yielded one ton per hectare. The plot on the right, alternating vetiver hedges and nitrogen-fixing tephrosia with rice, yielded five times that amount. CAP promoted the use of vetiver for soil erosion control and soil regeneration in agriculture as well as for erosion control along rural roads and railroads.

construction began. We also got environmental approval before working on the FCE railroad. Road construction companies were sensitized to environmental issues and were required to stabilize sites along roadways from which dirt was removed to be used on the road. Vetiver has become an important tool for stabilizing these fill sites.

Vetiver, a cost effective way to protect rural infrastructure.

Madagascar is known for its soil erosion problems and the CAP project was not immune. In the rainy season after our first year of road rehabilitation work, we began to see that our investment in cement work (culverts, causeways, bridges, and drainage canals) and in rehabilitation of the roadbed itself was being threatened by erosion.
We redid some hydrological studies, designed sturdier cement structures, and encouraged construction companies to be more conscientious about making sure grass was planted and well established along the roadsides. These measures helped some, but not enough.
Finally, our project officer Dale Rachmeler suggested we look into vetiver grass technology, which he had read about. He pointed us to a vetiver web site, established by the Vetiver Network, headed by Dick Grimshaw, a retired World Bank agricultural officer. We contacted Grimshaw and invited him to come to Madagascar to see whether and how vetiver might be used here.

Grimshaw visited Madagascar in 1997 and his colleague Paul Truong came in 1998. They concluded that vetiver would be a very appropriate solution here. They trained CAP staff and others in vetiver applications for both agriculture and infrastructure. Many people became convinced of vetiver's potential.
In the less than two years since Grimshaw's visit, we and our partners have planted over 1.6 million vetiver plants (160 kilometers'worth) and gone a long way toward the point where one can say Madagascar has adopted this technology.
Before CAP's arrival, two companies produced vetiver, now there are twenty. Nurseries have been set up by private companies, CAP road user associations, association members, municipal government, and construction companies.

We have planted about a million plants of vetiver just along CAP roadways, stabilizing gullies, roads, cement work, and fill sites along the road (equivalent to about 100 linear kms of anti-erosion hedges). Causeways are less affected by silt, and cement works are better protected, and roads less damaged by run-off thanks to vetiver's capacity to rechannel, slow down, and filter water.

The cost of protecting road embankments and slopes with vetiver is less than 10% of the cost of stone or cement surfacing protection.

We have also planted about 200,000 additional plants to help stabilize slopes in agricultural areas and watersheds.

Tiana Rajoelisolo coordinated the environmental part of CAP, and was responsible for the professional application of vetiver technology to ensure sustainable biological erosion control. She replaced Voahangy Randriambololona, her predecessor who has helped launch the Madagascar Vetiver Network.

Madagascar Vetiver Network

By creating the NGO the Madagascar Vetiver Network in 1998, Madagascar has joined the 120 other countries connected to the international vetiver netowork. This NGO has the responsibility of diffusing and exchanging information to concerned parties throughout the country.

Involving Partners in Environmental Protection

In Mahajanga, CAP drew on support from a private company, environmental foundation, World Bank program,

Dale Rachmeler was the second project officer. He brought both a supportive attitude and extensive technical expertise. He was the first one to alert the project to vetiver grass technology as a possible solution to roadside erosion problems.

and the government to support environmental protection measures carried out by the Bekobay road users associations in the area along the 46-km Bekobay road.
The shrimp company Aqualma paid for labor and provided materials and tools valued at 6 million Fmg ($1200) to plant vetiver along the road itself. The Tany Meva Foundation , WE-GO Rotary Club International (USA) and the Vetiver Grass Network also contributed.
The Bekobay road users, as general contractor, also used World Bank Irrigation Program funding to plant vetiver to protect the Ambohimenabe watershed, and planted 1000 eucalyptus trees provided by ANAE over a 400 square meter area in Ambalavelona, along the road.

Sustainable Agriculture

CAP trained agribusiness clients in low-till/no-till agriculture, which is a practice to preserve soil fertility. CAP, the NGO TAFA, and CIRAD diagnosed soil problems affecting geranium production and proposed no-till/low-till practices as well as green manure to improve soil fertility. The BRF ("Bois Rameaux Fragmentés") composting technique was diffused jointly with the Comité Jean Pain Madagascar for geranium production.
We also worked with CJPM to organize training in BRF for CAP staff and clients. Finally, we helped SIDEXAM and small farmers around Fianarantsoa test and carry out the production of organic tea using compost and mulch.

Studies Supporting Sustainable Agriculture

CAP undertook, at the request of clients, studies on:

- The market for compost.
- The feasibility of converting the Sahambavy tea plantation to organic production
- Prospects for environmentally favorable enterprises in Kalalao.
- The wood subsector in Fianarantsoa.
- Potential for ecotourism in Sainte Marie Ankarafantsika.
- The feasibility of charcoal production for the cement factory of Ibity.
- The feasibility of watershed reforestation on the 50-km Bealanana road.
- A plan for environmental protection along the 46-km Bekobay road, where follow-up will be carried out by the LDI program. The study addressed com munity organization, charcoal production, and watershed protection.
- Testing ways to accelerate the multiplication and survival rates of vertiver to reduce user costs.

We also put on a seminar on soil protection and restoration attended by 60 people coming from the private sector, and development and conservation organzations. In general, studies indicated the potential profitability of many environmentally-favorable actions, but clients'limited financial means and a difficult banking environment limited the number of actions that will be pursued.
The main actions resulting from the studies have been, first, that road user associations are linking road maintenance to environmental protection, as in the Bekobay case mentioned above.
Second, the major donors (World Bank, European Union, Japanese, French, Swiss, and Germans) have adopted measures to finance the use of vetiver within their projects.

BEST PRACTICES

■ Vetiver grass technology offers a viable, low-cost bio-engineering technique for control of soil erosion. Production, transport, placement and watering of the plants must be carefully managed for a few months, then the plant is self-sustaining. The technology is on the verge of being widely adopted in Madagascar.

■ Wide diffusion of information on appropriate technology through vigorous use of written material in Malagasy, pictures, fairs, videos, school participation, newsletters and press releases had a multiplier effect.

■ Composting, mulching, and organic agriculture offer significant promise for restoring soil fertility and rebuilding soil structure.

■ Because road maintenance, by definition, involves a minimum of environmental protection, road user associations are a potential mechanism for expanded environmental protection activities.

Vetiver's fast growing, deep roots help anchor the soil and bring up nutrients found only deep below the surface. Vetiver technology requires skill and attention to work properly, but its payoffs are considerable. The cost of vetiver to protect a rehabilitated road averages between 1-3% of the capital cost of the road.

The Railroad and Port:

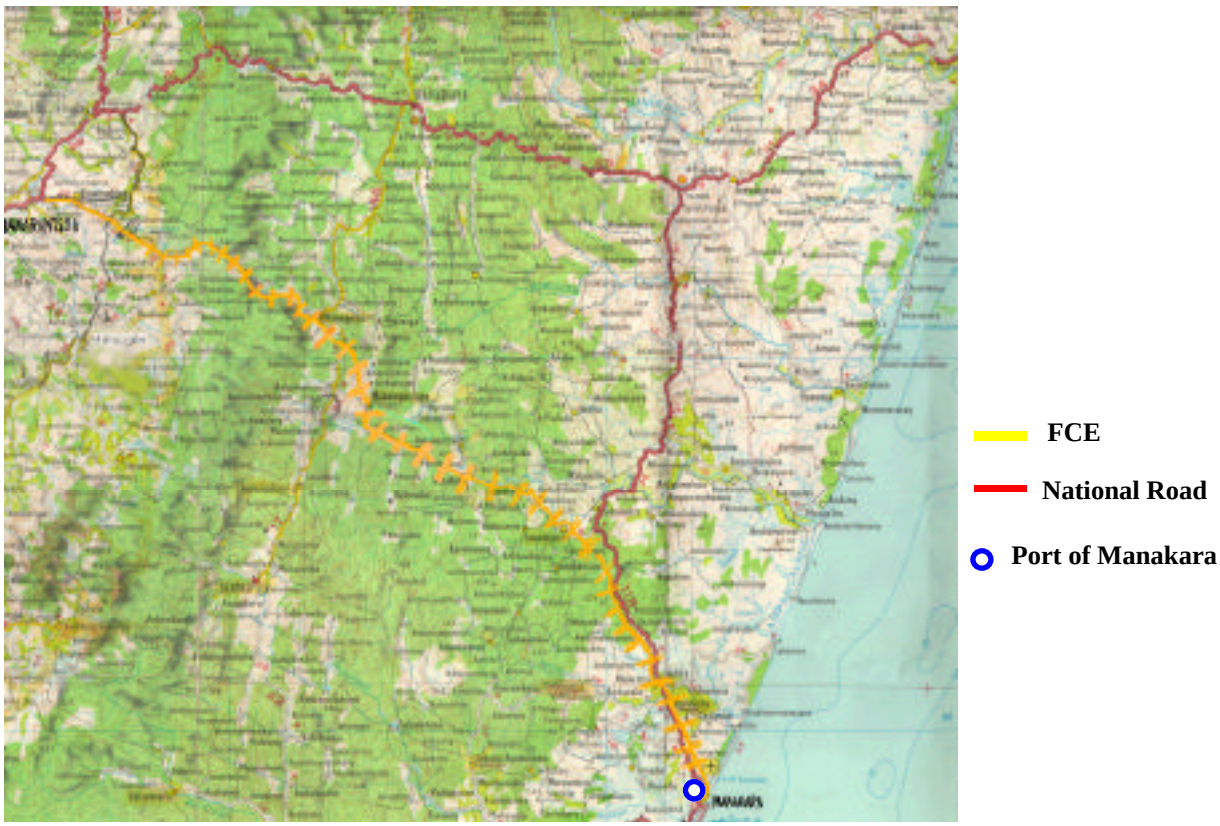
Groundwork for Long-Term Viability

The condition of transport infrastructure, whether a farm-to-market road, railroad, or port, profoundly affects farmers'options and decisions. In the case of the Fianarantsoa Cote Est railroad, the farmers living near the 167-km line are especially dependent on the railroad because there are almost no other ways to transport goods to or from Fianarantsoa or Manakara. As a result of the degradation of the FCE over the last 20 years, farmers along the line have cut back their production of cash crops (coffee, litchis, cloves, banana, pepper) and have tried to replace them with subsistence crops which require slash and burn agriculture. Degradation of the port of Manakara has likewise contributed to a decline in cash crops along the railroad and coastal plain.

Concerns about both the railroad and port were raised by our Fianarantsoa area clients, including members of the Regional Infrastructure Committee, which is the group of regional representatives responsible for making recommendations on regional infrastructure rehabilitiation priorities. Many felt that improvements to these two transport infrastructures would benefit not only people living near the rail line and port, but would help stimulate growth of the entire region. They also felt that if the railroad were not improved, the Fianarantsoa-Ranomafana-Manakara road (see map at right) would have to bear more traffic, which would increase pressures on the environment in the ecologically important area around Ranomafana National Park.

For these reasons, CAP agreed to try to find ways to help improve both railroad and port services as part of its transport infrastructure component. Full rehabilitation of these entities was out of the question, since the costs would have far exceeded our available funds.

However, we decided to look at what we could do to improve the service in the immediate term and at the same time investigate possibilities for long-term viability.



The FCE Railroad

The 1996 Godeau report.

CAP began to work with the FCE as a potential client in 1995. In 1996, strategic planner Alain Godeau conducted a review of the strategic options. Godeau reviewed past studies, which concluded the line was not viable. He concluded that the studies took too narrow a perspective. He toured the area and met with FCE employees and private operators in the region. He encouraged consideration of the railroad's potential in the context of regional development.

He pointed out that the only two ways to get from the east coast to Fianarantsoa were the road via Ranomafana or the railroad. He noted that although rehabilitation of the FCE could cost $20-30 million, rehabilitation of the road would cost on the order of $40 million and that the road could be more expensive to maintain over the next several decades.

Despite these factors, however, he did not go as far as to say that the railroad would be viable in the long run. The low level of traffic did not permit enough revenues to cover costs. To attract more traffic, the railroad needed to be rehabilitated and additional investment needed to be made -- investment in roads and the port of the type that CAP could make, and technical assistance of the type CAP offered to agribusinesses.

It also depended, to a significant degree, on what the employees and users of the FCE could contribute to its management and rehabilitation. Based on this assessment, he recommended that CAP undertake a short-term program (programme d'urgence) to see what the FCE could do for itself in a couple of years with CAP's help, and if that proved successful, to move toward some sort of privatization option. (See Godeau report on the CAP CD Rom.)

The long neglected FCE was near closure when its management and customers convinced CAP to take a serious look at its potential. CAP undertook a test program, rehabilitating some sections and improving management. Early indications are that the railroad may indeed have the potential to play a key role in reviving the regional economy and minimizing environmental damage caused by heavy truck traffic through Ranomafana National Park.

Strategic Options for the FCE

Over three years, CAP carried out five of the six major recommendations made in the 1996 Godeau report:

- **Mobilize regional stakeholders**
- **Increase rates paid by the ooil company**
- **Improve operational effeciency**
- **Increase freight**
- **Carry out a pilot rehabilitation program**
- **Negotiate a long-term loan for complete rehabi litation (not completed)**

Programme d'urgence.

CAP began to undertake Alain Godeau's recommendations in early 1997. The effort was called the programme d'urgence. One of the conditions for our carrying out the program was that the government agree to cooperate by giving the FCE a certain measure of autonomy as well as certain assets. They agreed to this in 1997 and a memorandum of understanding outlining this agreement was signed in the same year. An agreement was also negotated with the state-owned oil company SOLIMA, the FCE's largest customer, to increase

the rates they paid, which had been below cost.

In the three years after the Godeau report was completed, almost all recommendations were carried out. These included buying and installing about 6.4 billion Fmg ($1.3 million) worth of equipment (financed through the ISF and local currency fund), rehabilitating some of the rolling stock and about 20 km of rail, working with management to improve operations (including getting the trains to run on a regular schedule), and taking a more service-oriented approach to customers.

CAP carried out the rehabilitation of one of the most important roads along the railroad, from Manampatrana leading toward the high potential area of Ikongo. As a result, the Japanese will now fund the entire road leading from Ikongo to the RR and beyond.

In addition, CAP went beyond the Godeau recommendations by hiring consultant Frank West who successfully solicited the equivalent of $500,000 of used rail equipment from Swiss railways. The value of the donated equipment, plus USAID's investment, amount to a little less than 10% of the investment Godeau estimated necessary to rehabilitate the entire rail line.

Team spirit and creativity helped us complete the complex tasks comprising the programme d'urgence.

CAP has also hired an operation specialist who is not only overseeing operational improvements along the line, but investigating ways to exploit the potential for ecotourism in the area.

Finally, it has also helped stabilize the embankments alongside the rail by planting vetiver. This stabilization will reduce the amount of downtime caused by landslides during heavy rains and cyclones.

Indispensable partnerships.

CAP involved many stakeholders in the identification of needs and carrying out the program. Each partner made an important contribution. For example:

- USAID provided 6.4 billion Fmg ($1.3 million) of equipment
- The employees of the FCE installed much of the new equipment and adopted a more service oriented approach.
- The national railroad donated rails and rolling stock granted the FCE autonomy, which was a condition of CAP involvement.
- The Ministère des Transports et de la Météorologie provided oversight and the Ministère de Développement du Secteur Privé et de la Privatisation worked with us to develop ideas related to privatization.
- Swiss railways, provided equipment and joined in solidarity with the Malagasy railroad workers, thus leveraging the amount of money needed to finance rehabilitation.
- The private sector, the main stakeholder concerned with the railroad's future, contributed an understan ding of their needs and a willingness to make small financial contributions.
- French cooperation purchased communications equipment.

These freight cars were donated by Swiss Railroad companies which were repainted by Swiss artists with motifs expressing solidarity between Swiss and FCE railroad workers.

- Telma, the telephone company, is providing 110 million Fmg to support activities that extended tele phone service along the line.

To follow the progress of CAP interventions, a monitoring committee comprised of FCE personnel, Northern Line personnel, and consultants was established. The members of this committee have met regularly to follow the work step by step, to plan trips to the line as necessary, organize meetings with ministers, and to divide up other work to be done.

The importance of people with vision, creativity, and energy.

As the US ambassador said, "CAP has been an encouraging presence for people who might otherwise be forgotten." Several outside interventions have reignited the spirits of FCE staff who were beginning to feel hopeless about the railroad's future. In addition to Alain Godeau and Frank West, mentioned above, we could cite:

- The Administrateur Délégué of the RNCFM who signed a Memorandum Of Understanding between CAP and the national railroad regarding coopera tion to carry out the planned program and the role to be played by the northern railroad, which is the parent network.

- Gilles Rasoamanana, a retired employee of the Malagasy railroad, who carried out detailed assess ments of the condition of FCE infrastructure and rolling stock to determine which rails and cross ties needed replacing, and what material and equipment needed upgrading, replacement and repair.

- Eddy Rasoanaivo, coordinator of CAP's interven tions, who spared no effort in working through administrative challenges connected with the open bidding, for which the required procedures are not designed to facilitate an "urgent" program, such as this one.
  Tiana Rajoelisolo, Raoul Lalut and Hans Christian Raharijaona, three other CAP staff worked alongsi de the Railroad and promoted tourism, which has tremendous potential in the region.
  They have also looked into environmental protec tion activities, such as the establishment of vétiver to limit erosion and landslides. They have also worked on how to improve the administrative and organizational capacity of the FCE.

The importance of the FCE for the southeast region.

The FCE serves an area between Fianrantsoa, Ikongo, Manakara, and Ranomanfana. About 800,000 people live within this area. The economic value of fuel and agricultural products carried along the line is significant, estimated at 30,000 tons per year. In addition, there are many other benefits that accrue to the people along the line:

- Wages from loading and unloading of products.
- Circulation of information.
- Transport of sick people.
- Transport of children who would not otherwise be able to attend school.
- Provision of basic material needs.
- Revenues earned by merchants at each station.

Steps toward privatization.

In 1998, CAPcarried out a study of the various possible legal frameworks for privatization. Since then, CAP has worked with the transport ministry and the privatization committee to reach a consensus on privatization.

The FCE railroad is the economic life-line for the entire region. It provides the trade and transport node for about 800,000 people.

The rehabilitation work began when the material and tools financed by the ISF and local currency fund arrived in June 1999.

As of June 1999, we understand that there is serious interest on the part of the privatization committee to move ahead with the privatization. However, World Bank funding for the privatization study will not be available until Madagascar signs the master framework for the country's economic program. We expect this soon.

Steering committee.

At the request of FCE personnel and users, CAP helped set up a steering committee. CAP identified stakeholders, primarily people from the private sector and those living along the rail line.

This civil society group has met regularly to discuss how they can take more responsibility for the future of the railroad.

They are aiming to defend the interests of the FCE, protect what has been accomplished so far, and continue efforts already undertaken -- all by playing the following roles:

- Participate in the allocation of resources.
- Support civic pride and safeguarding of assets
- Contribute ideas on how to improve service, recognizing the FCE's constraints
- Serve as a spokesperson vis a vis decision makers (the government and bilateral, multilateral, and pri vate donors).

The Port of Manakara

The port of Manakara is the main port for the export of cash crops in southeastern Madagascar.

Following a decade of neglect in operations of the port, the port operations and dockworkers company, the Société de Batelage de Manakara, asked for CAP's assistance to study port management and operations.

There are many problems, which are far from being solved. Using a participative approach, CAP worked with the operations and dockworkers company, the chamber of commerce, and the customs service, as well as the Ministère des Transports et de la Météorologie to develop a work plan and to coordinate interventions.

CAP consultant Ray Lawler carried out a study in December 1997, which offered short- and medium-term technical and administrative recommendations.

CAP will not be able to carry out all of the recommended activities.

However, SBM has begun implementing the prinicpal short-terms recommendations, demolition of buildings on the old quay, and loading and unloading operations in the southern section to ease and speed up handling of agricultural cargo (mostly coffee, pepper and litchi).

BEST PRACTICES

■ The review of strategic options for the railroad helped people question the conventional wisdom and see the railroad in a larger context.

It also provided a vision that many people could adhere to and which provided the basis of action for three years. A key part of that vision was the importance of attacking the challenge on many fronts at once:

working not only on the railroad itself from many angles, but rehabilitating roads leading to the railroad, rebuilding a bridge connecting two roads leading to the railroad, providing technical assistance to agribusinesses along the line, and taking some actions to improve the port.

■ Hiring a fund raising consultant to solicit equipment donations was a creative, unorthodox idea that will bring the railroad close to $1million of equipment and establish a solidarity relationship between Malagasy and European railroad workers.

This is unconventional type of private foreign assistance can continue to benefit the FCE and may have applications in other situations.

This reinforced submersible bridge at Ambinanitromby built by CAP with Japanese funds links the rich coffee growing area of Ikongo with the FCE rail line and the port of Manakara. Trucks had not been able to cross this river to reach the rail - road since the original bridge (metal structure on right side of photo) was destroyed in early 1990.

Input Supply Fund:

Generation of Local Currency Funds

The ISF had the following objectives:

- Provide scarce foreign exchange to importers of agricultural inputs and equipment. Difficult access to inputs and equipment was considered a signficant constraint to agribusiness development.

- Generate Malagasy francs to fund the rehabilitation of rural roads. This mechanism was not only a way to address the lack of rural transport, which is a major contraint to agricultural development, but it was a way to involve the private sector in the coun try's development.

The fund also allowed the Malagasy government to economize on foreign exchange.

Import Procedures were Advantageous for Clients

The ISF was initially funded at $16 million. Some changes in the criteria for participation in the fund were made during the first year, to take into account liberalization of the Malagasy economy. Then, the amount of the fund was reduced to $8.5 million due to cuts in the USAID budget. These funds are outside Chemonics'contract, held by Citibank in New York.

These tractors were imported disassembled under ISF and assembled at low cost by importer, saving farmers 22% on purchase cost.

Participants in the fund benefited from the following advantages:

- Defferred payment of 180 days upon presentation of a bank guarantee.
- No foreign exchange risk because the Malagasy franc to dollar exchange rate was fixed at the time of the request
- No costs for handling letters of credit, since Citibank in New York handled the USAID funds.
- Local bank fees were reduced to a minimum. There was one significant problem experienced by participants: the restructuring of local banks. In some cases, this made it difficult for participants to obtain a bank guarantee, which was required to ini tiate transactions. (The ISF authorized release of dollars by Citibank only once the local bank gua ranteed that local currency would be available at the time of delivery of the goods being purchased).

Over the course of 32 months of operation, ISF staff contacted 273 businesses and accepted 93 applications. 10 applications were rejected either because the bank guarantee was insufficient, because the participant was proposing to import goods from countries not on the US government list as acceptable for participation, or because the product itself was not on the list of acceptable products.

Approved transactions amounted to 95% of the $8.5 million. A list of these transactions can be found in the annex.

Due to imperfections in procedures, it was not possible to use the last $70,000 in the Citibank account. Those funds, amounting to 0.8% of the total, will be released and returned to USAID.

End Use of ISF Imports

In marketing the ISF, we encouraged participation of CAP agribusiness clients so as to create synergies between the ISF and agribusiness components of our project. We succeeded in creating a few synergies:

- The Mahajanga-based agribusiness Aqualma imported motors and electric generators. Aqualma also received agribusiness support from CAPand contributed to the maintenance of the Bekobay road and to environmental protection in Bekobay.

- The Mahajanga-based client rice collector Deux Freres Juniors imported accessories and spare parts for a rice mill, which was designed with the help of a short-term consultant working under CAP's agri business component. The company collects 40% of its paddy in Bekobay, a zone opened up by the CAP road.

- CAP's wine-making clients in Fianarantsoa were the end users of some caustic soda and other pro cessing products.

CAP surveyed importers and end users to confirm the end use of imported products. The table below shows the principal end uses of ISF imports.

Local Currency to Rehabilitate 460 Km of Roads

While the ISF paid suppliers in dollars, the local currency that importers paid in return was deposited in the Central Bank where it was used to pay for road rehabilitation.

The local currency amounted to 34 billion Fmg, which amounted to 95% of the $8.5 million available.
These funds were the principal source of funding for the equivalent of 460 km of roads that opened up eight Fivondronana.

Product	**Use**
Tractors, irrigation pumps, sugar processing equipment, rice mill, shrimp food	Support agribusiness activities
4254 tons of construction materials	Repair structures used in agribusiness
Oil and lubricants for motors and spare parts	Support the transport sector, including the transport of agricultural products
1372 tons of newsprint	Support dissemination of information, including business information
Baggage scanners	Help customs officials control smuggling of endangered species
Industrial raw materials	Contribute to general economic development

BEST PRACTICES

To keep the project relevant to clients'needs, it is important that contractors have enough flexibility to make adjustments in the scope of work as the need arises.

We were fortunate to be able to adapt the ISF when one of the principal constraints it was designed to address difficult access to inputs because of foreign exchange scarcity disappeared just as we were shifing from the design to implementation. Even though access to foreign exchange was no longer a major constraint, access to inputs was still difficult because importers had difficulties obtaining credit.

We were able to add a deferred payment provision to the ISF that made it relevant to clients'needs.

Administration:

Facilitating Information-Sharing, Teamwork and Results

The establishment of a high-performing financial and administrative management sytem was a priority from the beginning. The finance officer Mark Heim and administrative officer Martine Catry were the first team members hired. Their initial work, made possible by bridge financing from USAID, helped us get off to a good start.

The administrative unit combined a customer-service, problem-solving orientation with a commitment to integrity and cost consciousness.

The home office also sent its project administator Jim Diller to work with the field- office team for six months to tailor our standard systems to the project's needs. As a result, the two regional offices were fully operational five months after signing of the implementation contract.

Administrative and Logistical Support to Technical Components

The administative unit played an important role in supporting the technical staff. A few numbers illustrate the enormous number of tasks required to assure the smooth implementation of our technical work. Between1994 and May 1999, there have been:

- 818 travel requests (ordres de mission) received and processed
- 358 airplane tickets issued with regular pick up at airports
- 1,975,000 km driven by 11 cars and 20 motor cycles consumed a light maintenance budget. All cars are in good operational conditions after 5 years of heavy service.
- 340,515 liters of gasoline and diesel fuel consumed and gas coupons tracked

Financial Management

Financial management is key for CAP. We managed our spending so as to have 2% of funds remaining at the end of the project to cover unexpected expenses. We expect to hit this target. The remaining funds will allow us a short extension. The administrative work was divided between Antananarivo and the two regions.

The Tana office paid the staff and managed gas coupons. It purchased office furniture and most consumables. Regional offices had their own bank accounts, in which they kept an average of 25,000,000 Fmg, replenished monthly. In four years and nine months, CAP has recorded 16,594 accounting entries, or about ten entries per day. It has issued 5,084 checks worth a total amount of 10,449,942,979 Fmg or roughly $2 million.

The home office conducted an audit in October 1997. It concluded that administrative and financial management was exceptionally good.

Personnel management

The CAP team was the pillar of the project's success. The team members were known throughout the development community as especially professional and dynamic.

The team was bigger than originally envisaged because we decided to create an in-house infrastructure unit instead of contracting out the design and supervision of the road work.

The finance/admin unit was headed by Mark Heim. His knowledge of both USAID and the local culture, combined with his good humor and sound judgment helped start-up go smoothly. He also helped establish the team spirit and an ethic of problem-solving, information sharing, and integrity.

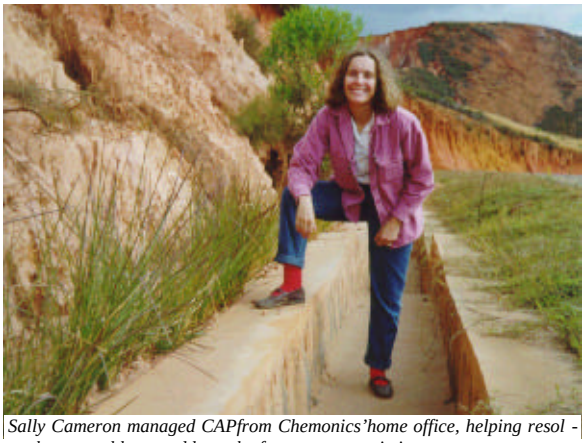
It was this in-house unit that was responsible for so much creative work on the roads. Ninety-three people worked for CAP in all. These included:

- 26 full-time technical staff, including 7 expatriates.
- 24 part-time supervisory engineers who had contracts to work on specific road projects.
- 63 support staff.

In addition, 149 consultants worked on the project.

Chemonics strengthened staff skills by training, teambuildings, and study trips. Administrative staff developed a connection with technical activities by accompanying technical staff to project sites.

This helped them understand the issues and be better able to respond to needs. Effective personnel management systems enabled the project employ a large number of people while still meeting the needs of individual staff members and maintaining a high level of productivity.



Sally Cameron managed CAPfrom Chemonics'home office, helping resol - ve thorny problems and keep the focus on strategic issues.

E-mail and Internet access for every staff member sped up learning and cross fertilization.

Information Systems

Ease of internal communication was a strategic challenge given the geographical distances between Washington, Antananarivo, Mahajanga and Fianarantsoa, the complexity of the work, and the limited communication infrastructure in Madagascar. CAP responded to this challenge by:

- Sending 2,210 pouches by private courier between Tana and the regions.
- In Tana alone, receiving 21,000 telephone calls and making 14,700.
- Equipping the two vehicles in Tana with cellular phones to increase driver efficiency.
- Handling 2000 official emails between Tana and the home office in Washington.
- Organizing 94 general staff meetings.
- Sending 2,210 faxes between the three offices.

E-mail. In 1995, CAP worked with the Data Telecom Service, a Malagasy internet access provider connected with Telecom Malagasy and France Cable et Radio, hoping to be one of the first to install internet access in Madagascar.

This worked well. CAP also increased its computer capacity and was able to set up email on each work station, which had the advantage of facilitating the exchange of technical information at a reasonable cost.

The cost of our internet connections is only 30% of our telephone bills. CAP staff send an average of 1000 emails a month between Antananarivo and the regions. Staff have used Internet to carry out research for clients and to set up web sites for clients.

CAP also set up an intranet which helped with trip management, vacation planning, etc. While email and internet were an immediate success and useful tools for cross pollination, intranet was less popular.

CAP also established a procedures manual. It was revised after four years, in conjunction with LDI.

Communications Outreach

Our strategy was to wait until we had some results to report, then to communicate tangible and innovative results such as those related to the management of public infrastructure using private associations, road rehabilitation methods, or vetiver grass technology.

The project organized conferences, workshops, and seminars to diffuse innovative approaches, and developed an email newsletter, all supported by the administration division.

Logistics

CAP maintained three offices and five expatriate houses. We also managed the AID warehouse. Given the almost 3000 items stored in the warehouse, we had planned to set up custom-made software to manage this. However, due to other more pressing tasks, we had to abandon this objective. The inventory is still managed with Lotus. LDI took over the management of the warehouse in January 1999.

The administrative division was always in ' effervescently responsive" to project needs. The division included accountant, warehouse specialists, receptionists, secretaries, drivers, information specialists and managers.

Closeout

The regional offices were closed in February and April 1999, although there are still socio-organizers and vehicles in each region, working out of the LDI offices.

In preparation for close-out of the Tana office, notices have been sent to suppliers and clients. Regional documents have been archived and transferred to Tana, except those that LDI can use. We expect a contract modification in July to extend the project until December. During the extension, the administration will continue its support role. Many of the staff have been transferred to LDI.

In Memoriam

Every project undergoes phases of intense exhilaration and unexpected losses. CAP had its shares of wonderful times. It also shared in the grief of its staff in times of trouble, and worse, in time of death.

CAP's most difficult passage was the untimely death of our deeply loved and respected Administrative and Finance Officer, our very young Hanitriniony Razafimaharo, who died suddenly in October 1998. She had just concluded a team building retreat with her large staff, and had been developing the project's work plan. When all of the tasks were outlined that had to be performed by the Administrative staff during the last phase of CAP, she added one to the list: "keep your smile." The project misses her.

Hanitriniony Razafimaharo headed the finance/admin unit for several months until her untimely death. Staff and clients benefitted from her boundless energy, insatiable capacity to help people, and impeccable professional standards.

We also grieved the untimely death of Rajaonarizaka Andriamihaja and Randriamaniraka Georges Lucien who were site engineers in Bealanana.

Both succumbed to illness contracted while serving in that very difficult environment. We grieved with their family knowing that no words can express their loss.

BEST PRACTICES

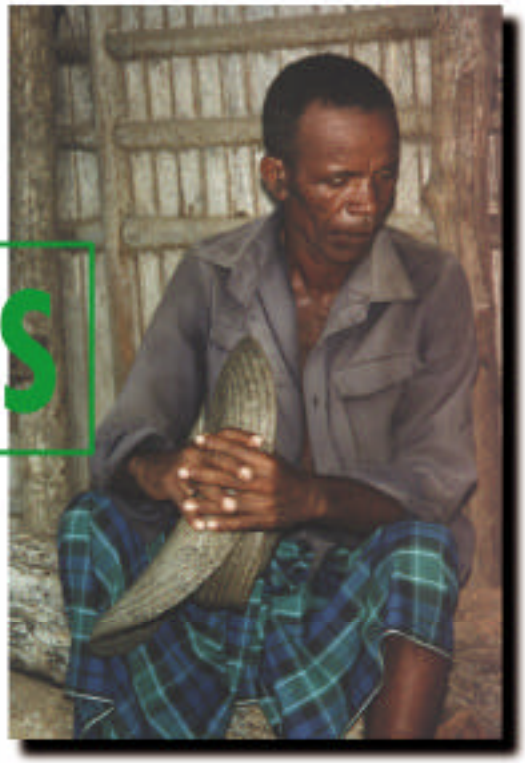
■ CAP succeeded in minimizing the number and maximizing the quality of staff meetings. There were two per month, each with a pre-established agenda.
Each meeting started with some funny story that stimulates participation by every staff person.

■ The administration had as its main goal to reduce the time that technical staff had to spend on routine tasks so they could better meet the needs of clients and beneficiaries. This service orientation served the project well.

■ CAP's outstanding internal communications systems facilitated a culture of information sharing and group learning, which in turn led to much of our success as a project.

And they did, too...

CONCLUSIONS



Conclusions

The CAP team has been fortunate to find many individuals and groups willing to work in partnership with us. They helped us understand the problems, worked with us to find solutions, and kept us excited about the work. We present below, first of all, some feedback from clients indicating how they experienced their work with us. We then summarize the immediate results of our combined efforts and present some thoughts about what benefits may occur in the future.

Olga Ramaromanana was CAP's monitoring and evaluation expert. She worked closely with each region to regularly monitor project impact among clients. Her continual update of Client Service Plans allowed the project to track inputs and results.

CAP Clients' Evaluation of Our Work

To get a qualitative sense of what CAP meant to them, our monitoring and evaluation specialist has spoken with many of our agribusiness clients, road user associations, local authorities, and partners. She found a convergence of opinions:

- **Promises kept.** When CAP agreed to provide a service or make an investment in an area, we kept our promises and carried out the work in a way that met their needs.

- **Professionalism**. We provided a high level of service because the staff was remarkably professional.

- **Willingness to be involved.** CAP staff were available on site even outside of work hours. They were willing to lend a hand in areas outside of their specific terms of reference.

- **Transparency.** The team behaved in a transparent way. We established mutual trust with partners and were able to collaborate efficiently thanks to good communication.

- **Moral support.** Clients and association members found our moral support important in helping them take on difficult and innovative activities.

- **The importance of roads.** Road were tangible results that made a difference in people's daily lives. (See additional details in the annexes.)

- **Help with financing.** Three-quarters of the loan applications submitted by CAP clients were accepted by financial institutions. CAP assistance made a big difference to these clients, who otherwise would have had a lower chance of getting financing, given restructuring of the banking sector and the fact that they were not mainstream borrowers. As a result of this financing, businesses were able to diversify their activities.

Our clients felt that we offered reliable technical and moral support that allowed them to take risks and try new ways of getting things done.

- **Work with partners.** About two-thirds of the partnerships we established turned out to be productive, about a third got bogged down and did not result in the synergies we had hoped for. FITAFA/KOBAMA, CJPM, CI,

PC, WWF, VGN, PPI, Tany Meva, PACT, LDI, RNCFM, ANAE, Swiss railroads, and FID were particularly effective partners, as were the European Union and the Japanese.

Results of our Work as of Today

■ **Agribusiness clients.** Many of our 164 clients are better equipped to operate in a market-oriented economy. About 45 agribusiness clients have benefited significantly from CAP's assistance. About 30 clients have increased their sales by a total of $3 million. One client was privatized. Twenty-two clients received loans amounting to $1 million. Most of these loans allowed the clients to diversify their activities (e.g., a rice collector expanded into milling, other businesses diversified into essential oils, ecotourism, milk processing).

■ **Road users.** CAP has rehabilitated the equivalent of 460 km of roads. As a result, transport costs have dropped. Traffic has increased, and since it is easier for collectors to get to farmers, farm gate prices have increased. The roads have also opened up access to health and educational benefits.

We estimate that the $12 million spent on road rehabilitation will bring at least a 20 percent rate of return. This estimate is based on the assumption that the associations will maintain the roads well enough to last an average of five years and that traffic will increase, thus allowing more products to get to market. These assumptions have been born out by our monitoring efforts so far.

There was also an assumption that road would engender an increase in agricultural production, but we questioned that assumption early in the project, due to findings in Madagascar and elsewhere that production increases did not automatically follow transport improvements.

However, in some cases, we were able to provide some support to producers directly, and we have encouraged other donors to focus on these high potential zones as well.

■ **Members of road users associations.** Association members have learned how to work together to set common objectives, raise money, and maintain roads.

■ **Road contractors**. Fifty-nine firms had construction contracts with CAP. Of these, 55 were small and 4 were large. All improved their capacity to carry out road rehabilitation. Eleven have learned to apply vetiver grass technology.

Chief of Party Criss Juliard loves people and loves to help make things happen. His boundless energy and commitment helped create a high-spirited team and establish productive partnerships with USAID and other donors, as well as with hundreds of individuals and organi - zations.

Future Benefits from CAP

CAP was an investment that will keep earning returns in the future. Some benefits will be reaped by those beyond our immediate clientele.

■ **More productive agribusinesses.** The capital investments made by 22 clients in the last couple of years will begin to pay off in the next three to five years.

The privatized cashew processing plant should be profitable in a year. Some of the companies that are now experimenting with new products and markets will begin to see increased sales in the next year or two.

■ **Better maintained rural roads.** There are two main components of our road maintenance model that could bring significant future benefits: the devolution of responsibility to user associations and toll collection.

Already, there are several donors in Madagascar (the World Bank, French cooperation, CARE, FID, and the European Union) which have incorporated major aspects of the CAP model in their road programs, which will involve about $50 million of rehabilitation. For example, the design of the World Bank livestock program's road component includes

Employees of the Ambalabe Farm, returning from watering newly planted vetiver. Farm owner Eric MacDonald worked closely with CAP to master vetiver technology. He is committed to expanded use of vetiver in Madagascar after CAP's departure.

involvement of local populations in the selection of roads, formation of road user associations, and establishment of rain barriers and tolls.

In addition, CAP staff have formed an NGO called Lalana (meaning "the road" which will continue to implement and improve on the CAP model, and the European Union, Japanese, and WWF have expressed interest in contracting with them to do this.

Finally, outside of Madagascar, the World Bank's African Road Maintenance Initiative has picked up on our experience and is disseminating it to other countries, so perhaps other countries will benefit from this model.

■ **Less soil erosion.** The government and three majordonors have indicated that they will include requirements in road contracts that vetiver be planted along the road and hillsides to protect cement work and the roadbed itself.

There are seven nurseries interested in expanding their vetiver business and 11 construction companies who have experience planting vetiver. The French and the European Union have concluded large contracts with a CAP vetiver supplier to rehabilitate a large watershed in the Lac Alaotra area, ad to protect a long road segment with vetiver. Both of these initiatives are the result of CAP's extension and demonstration work with vetiver.

If the government does in fact require planting of vetiver and if private operators also pick up the initiatives we have started, vetiver will have taken hold in Madagascar in a couple of years and tremendous savings will be generated in terms of longer road life, reduced soil loss, and increased soil fertility.

■ **Better rail service**. If our efforts pay off, a public-private partnership will take over management and ownership of the Fianarantsoa - Cote Est railroad.

Service will improved, people along the line and throughout the region will receive economic and social benefits, and the negative effects of road traffic on priority biodiversity areas will be minimized.

Finally, we ourselves have benefited.

We would like to thank USAID as well as the government and people of Madagascar for the opportunity to have participated in the project.

We have been tremendously enriched by the experience.

We will be watching to see how our clients are doing in the future.

The CAP staff, which began as a small dynamic and competent group, grew in skill and size over five years. They will transfer much of their learning and per - haps some of the CAP spirit to their next jobs.

SAMPLE PHOTO GALLERY

A large photo gallery of project activities can be found in the CD-ROM under *Photo Gallery.*

A "Transfert of Responsibility" ceremony where rural roads, their maintenance and the right to establish toll gates are transferred by the government over the private Road User Associations (AUP). These were festive and widely attended events.

One of the FCE's 17 stations stops. Note on the front of the engine a yellow tubing that reach on both sides of the under carriage. Sand is poured in these tubes won the rails in front of the wheels giving them better traction in the steep climbs the railroad makes winding up to 1,300 meters in the course of 20 km.

The old and the new bridge in Ambalavao. This road rehabilitated by CAP served to improve access of a rich cattle and rice region as well as a major tourist site managed by the WWF.

Protection of road with vetiver in the region of Bekobay

Newly planted protection of small cement culvert and road surface Note spacing and size of plants which were transplanted from nursery grown plants.

Quadrant planting of vetiver on river bank to protect both submersible bridge and access ramp. Picture is after third weeks of transplanting from "basket" technology.

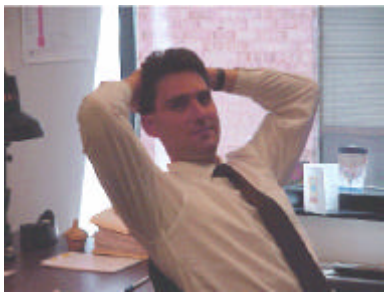
It Was a Team Effort:

In addition to those mentioned in the text, here are some of the People on CAP's High-Spirited, High-Performance Team

Jean-Robert Estimé, Martine Catry, Jacques Ravelonahina, Verosoa Mamy Raharivelo and Voahangy Rajoharison: Five of the approximately 20 CAP staff who will apply CAP's experience to the new Madagascar Landscapes Development Intervention program.

H Schar, regional director for Fianarantsoa , now acting COP during the extension period.

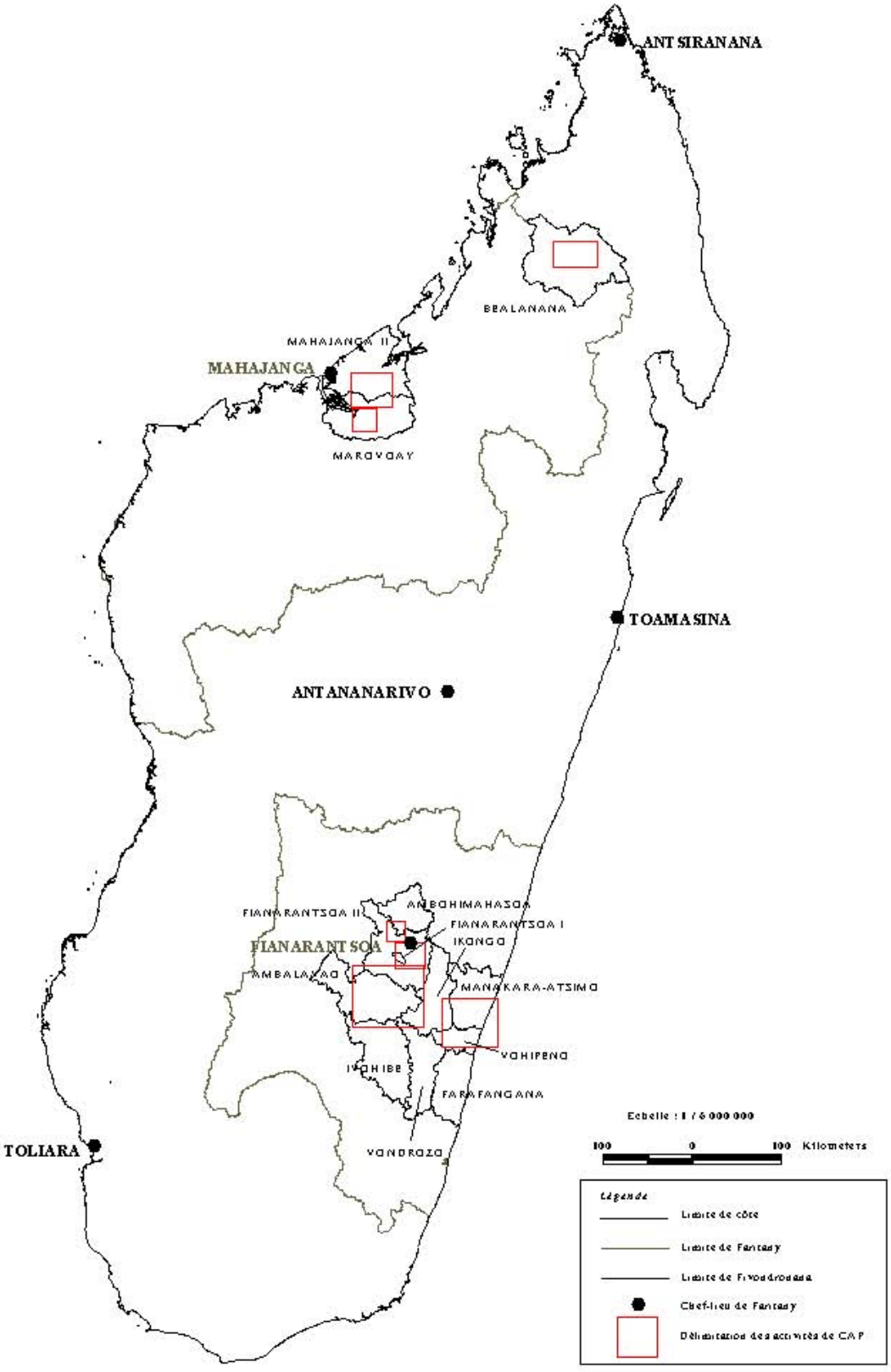
Jacques Ramahefy : Sucessfully managed the ISF transactions, during the first part of CAP



Jim Diller, administrative and technical backstopper in Washington.

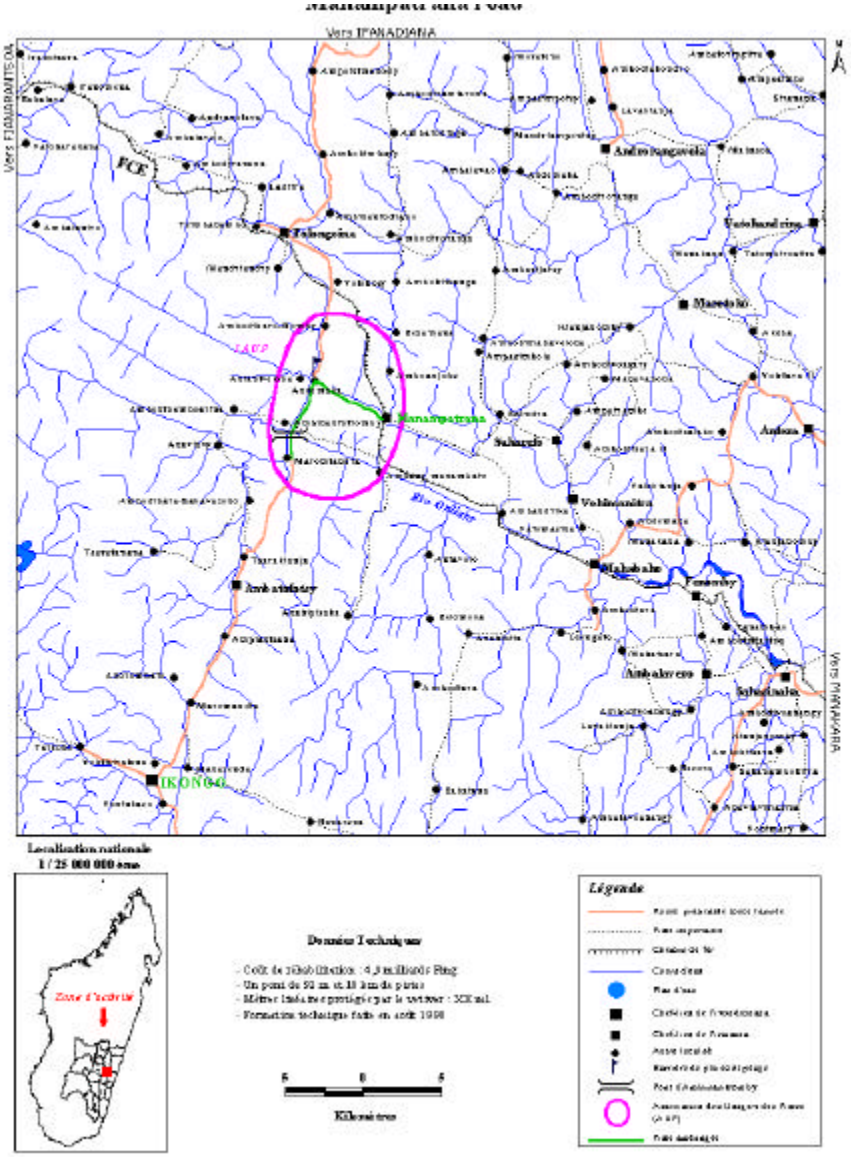
These and other team members will keep the CAP spirit alive in their new jobs.

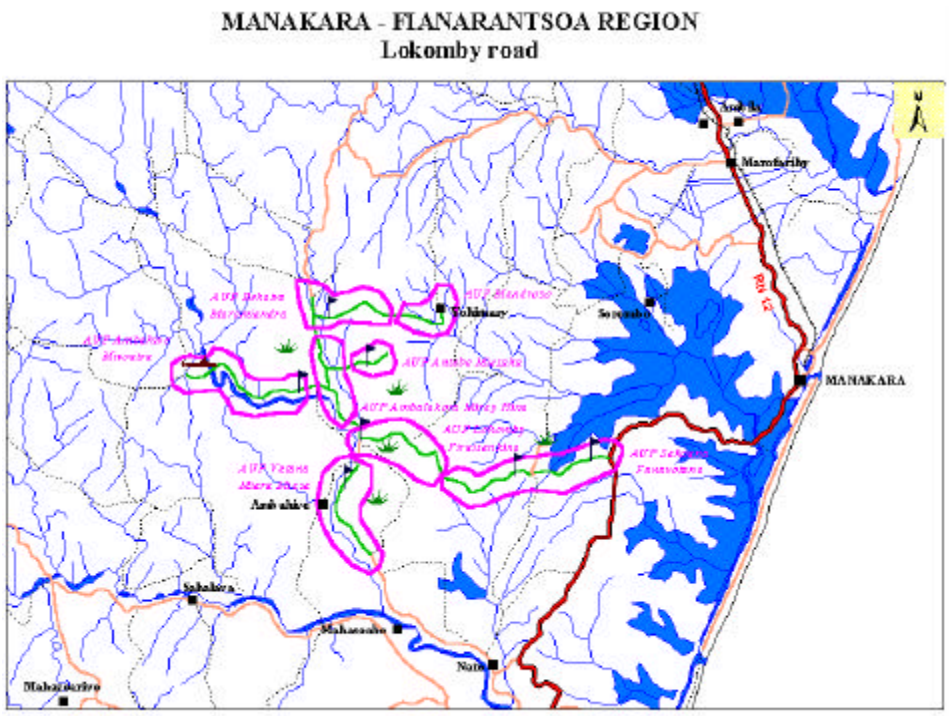
Pistes réhabilitées par CAP / USAID
Carte nationale de localisation



LES PISTES RÉHABILITÉES PAR CAP DANS LE FARITANY DE FIANARANTSOA

(Full sized maps can be found in the CD ROM





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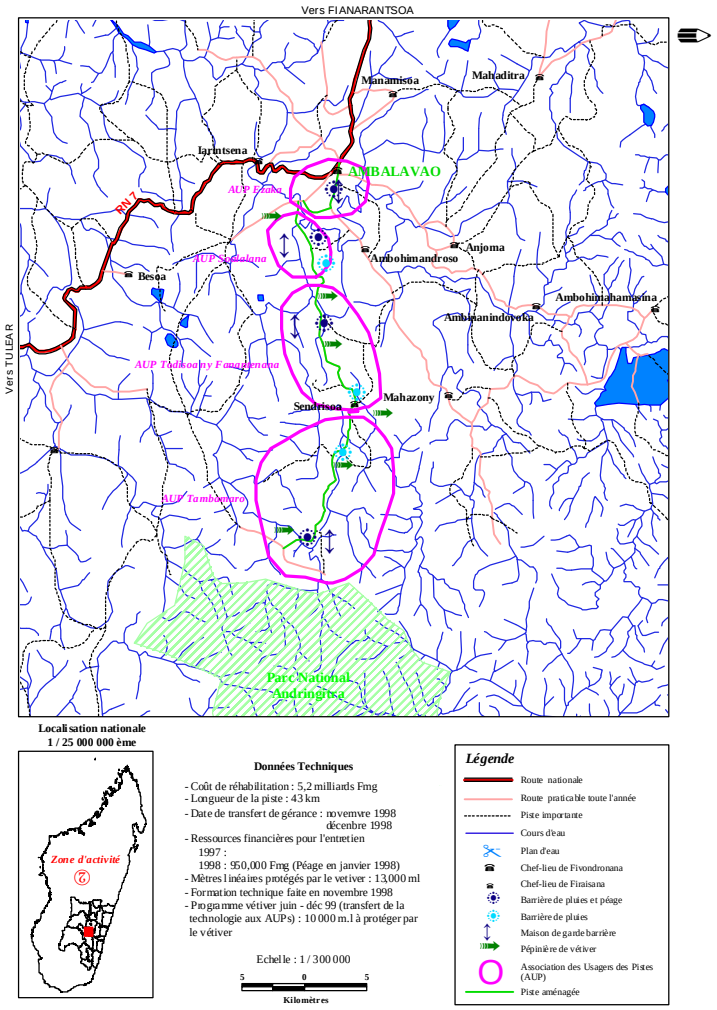
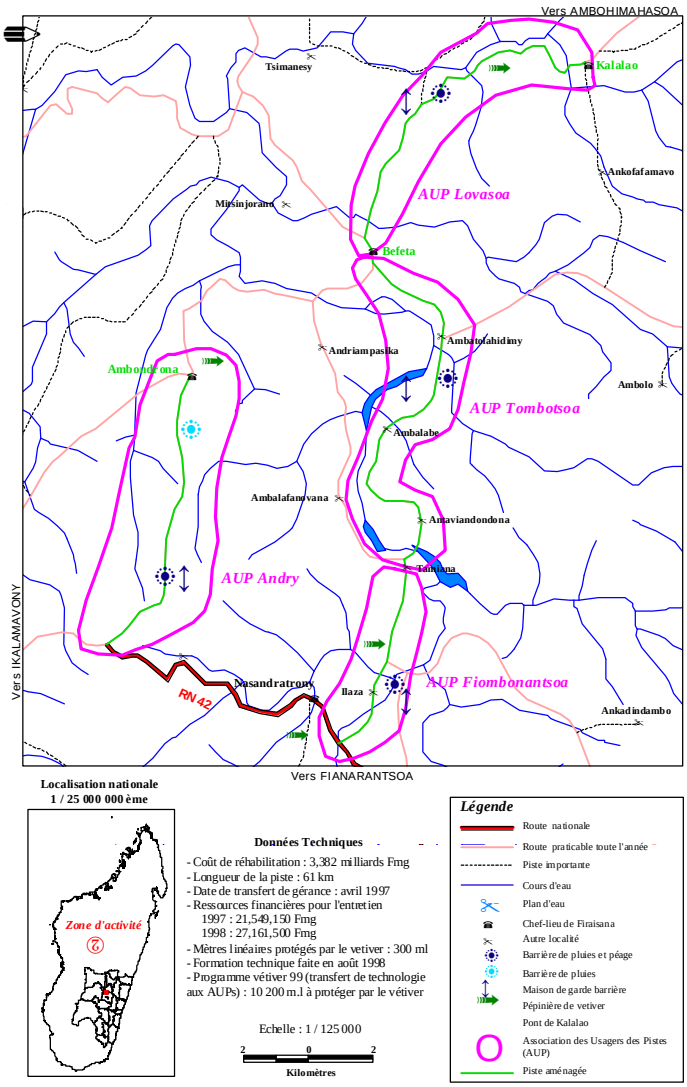
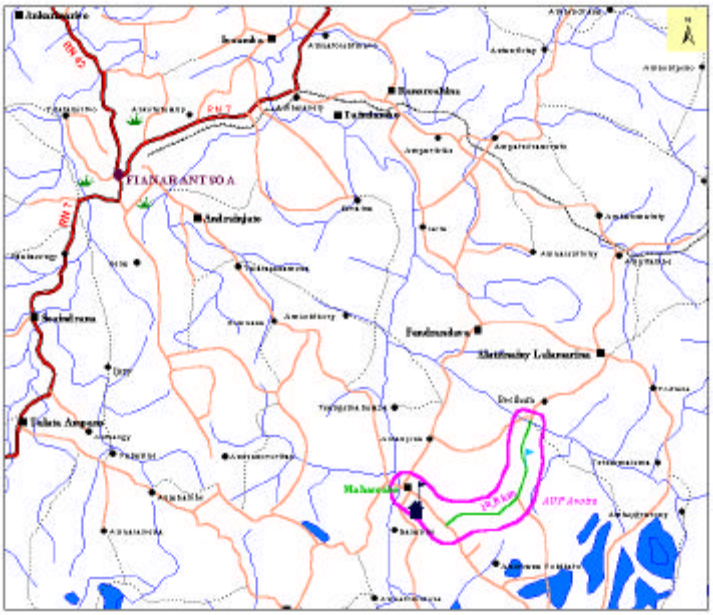


FIANARANTSOA REGION
Ambondrona road et Befeta - Kalalao road



FIANARANTSOA REGION
Mahasoabe - Ambalanivo road

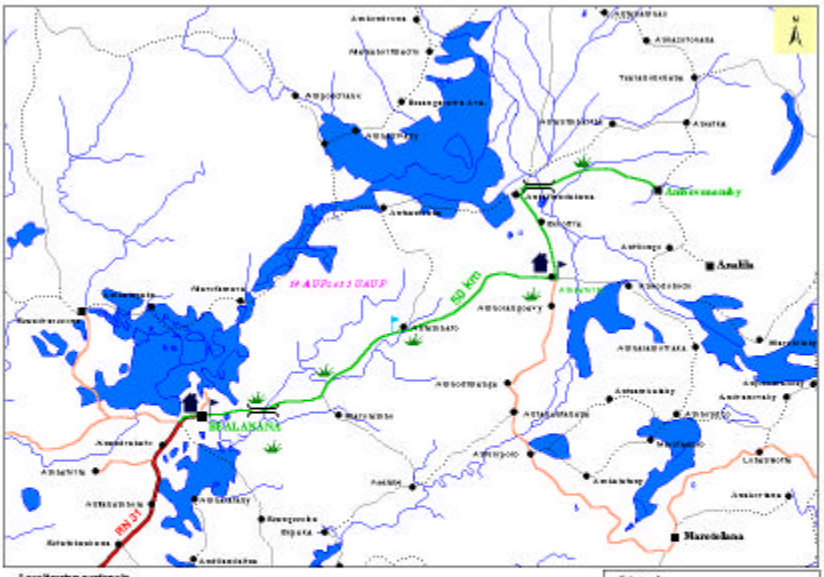


LES PISTES RÉHABILITÉES PAR CAP DANS LE FARITANY DE MAHAJANGA

(Full sized maps can be found in the CD ROM

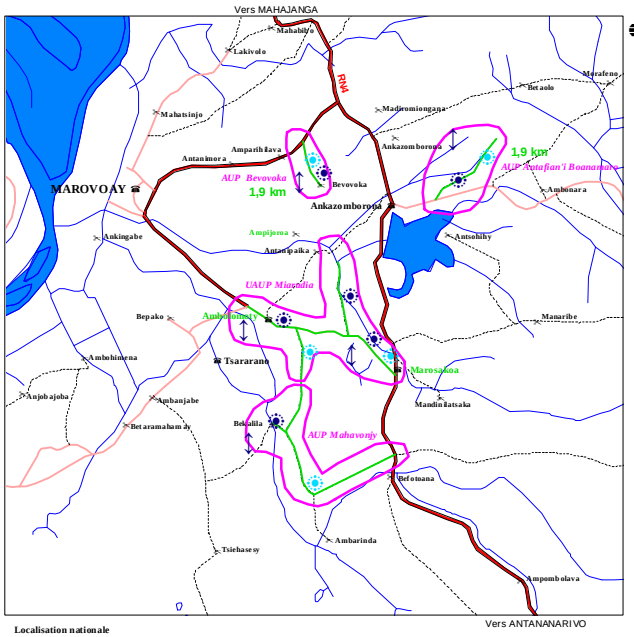
Les cartes complètes se trouvent dans le CD ROM)

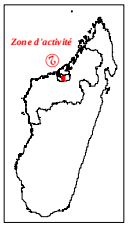
MAHAJANGA REGION
Bealanana - Ambatoria - Ambovonomby road



Données Techniques
- Coût de réhabilitation : 13,3 m illiers Fmg
- Longueur de la piste : 58 km
- Date de transfert de gérance : décembre 1998
- Ressources financières pour l'entretien
  1997 : 2 814 008 Fmg
  1998 : 21 516 080 Fmg
  1999 : [illegible]
- Nombre AUPs : 14 AUPs
  1 UAUP
- Mètres linéaires protégés par le vetiver : 20 008 ml
- Formation technique en décembre 1998
- Construction ouvrages à Ambovonomby
- Programme vétiver 99 (transfert de technologie aux AUPs) : 12 000 m.l à protéger par le vétiver

MAROVOAY - MAHAJANGA REGION
Marosakoa - Ampijoroa Ambolomoty road
Antafian'i Boanamaro - Bekarara road

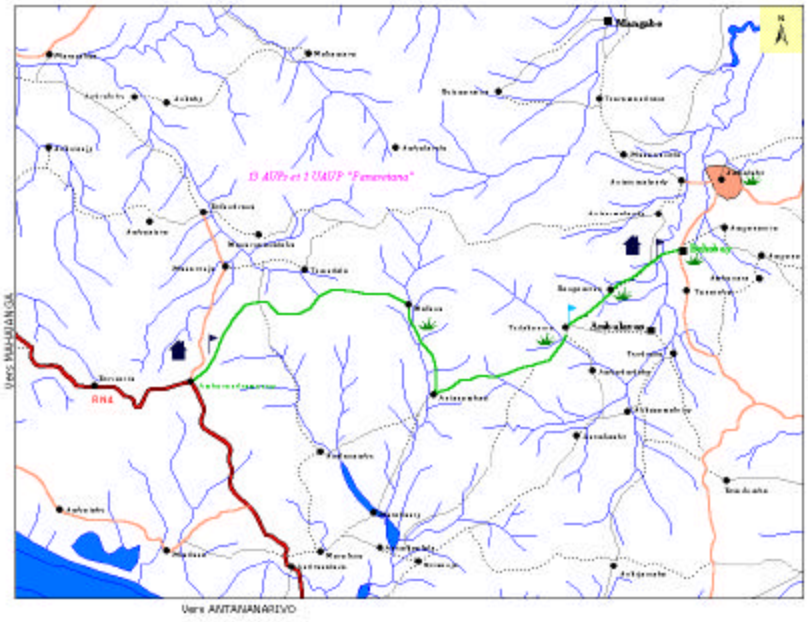




Données Techniques
- Coût de réhabilitation : 3,7 milliards Fmg
- Longueur de la piste : 23 km
- Date de transfert de gérance : 16 juin 1997
- Ressources financières pour l'entretien
  1997 : 14,051,404 Fmg
  1998 : 12,078,900 Fmg
  1999 :
- Mètres linéaires protégés par le vetiver : 350 ml
- Formation technique faite en août 1998
- Programme vétiver 99 (transfert de technologie aux AUPs) : 10,600 m.l à protéger par le vétiver

Echelle : 1 / 150 000
2 0 2
Kilomètres

MAHAJANGA REGION
Ambovomandresy - Bekobay road



Dossier Technique
- Coût de réhabilitation : 4,9 milliards Fmg
- Longueur de la piste : 45 km
- Date de transfert de gérance : décembre 1998
- Ressources financières pour l'entretien
  1997 : 31 698 208 Fmg
  1998 : 25 127 708 Fmg (prévu en janvier 1998)
- Nombre AUPs : 15 AUPs
  1 UAUP "Fanentsena"
- Mètres linéaires protégés par le vetiver : 5 500 ml
- Formation technique en août 1998
- Reconstruction d'ouvrages et compléments d'ouvrages
- Programme vétiver 99 (transfert de technologie aux AUPs : 3 000 m.l à protéger par le vétiver

LIST OF SELECTED CAP DOCUMENTS REPRODUCED IN THE CD ROM
ATTACHED TO THE CAP FINAL REPORT

LISTE DES DOCUMENTS CAP SÉLECTIONNÉS ET INCLUS DANS LE CD ROM
ATTACHÉ EN ANNEXE DU RAPPORT FINAL

CAP FINAL REPORT

Documents title/Titre des documents	Contents/Liste des points traités	File Name
Final report and maps		CAP final report
Photo gallery		CAP photo gallery

1. GENERAL ANNEXES

Fanoitsa	Journal paysan traitant des thèmes techniques du monde rural (français)	journal paysan fanoitsa
Rapport annuel CAP year 4 (english)	- Réalisations de CAP pendant l'année 1998 en agribusiness, infrastructure de transport (pistes, FCE, Port de Manakara), environnement	cap_rapport 4eme annee
Input Supply Fund : Rapport final	- Synthèse sur l'utilisation des devises américains sur l'importations des intrants agricoles - Impacts de cette composante sur le système de production local	ISF_finalreport
Input Supply Fund : Transactions	ISF listing et montant des transactions	ISF_transactions
Input Supply Fund : Use of local currency fund : table and projections	ISF : projection des fonds de contre valeur sur les importations d'intrants agricoles	ISF_lcf

2. INFRASTRUCTURE AND FCE ANNEXES

2.1 RURAL ROADS		
Documents title/Titre des documents	**Contents/Liste des points traités**	**File Name**
Performance Audit - Rural road	- Administrative issues - Technical issues - Maintenance - Professional assessments	piste_audit_US AID
Manuel d'entretien des pistes rurales	- Techniques d'entretien - Outils et équipements utilisés - Quantité de travail par unité de temps	piste_manuel_entretien
Environmental Screening Form : Etudes d'impacts environnementaux des pistes	- Cas d'Études environnementales de la piste à Ikongo, le pont d'Ambinanitromby avant la réhabilitation. Formulaire utilisé pour obtenir l'approbation environnementale avant d'exécuter les travaux de réhabilitation	piste_eie

List and characteristics of rural roads rehabilitated by CAP	- Name of rural road - Distance rehabilitated and km equivalent - Cost of rehabilitation - Communities involved - Name of AUP and UAUP - Transfer of management responsibility date - Date of Delegation authority	Piste_caracterisitiques
Manuel de procédures pour la réhabilitation des pistes	- les intervenants - les procédures de sélection des travaux -les procédures de création des structures d'entretien - les procédures de sélection des entreprises de travaux et la passation des marchés - les procédures de paiement des prestations - les procédures de suivi et de réception des travaux de réhabilitation	piste_manuel_procedure
Evaluation et Sélection des pistes par les membres du Comité de Gestion de CAP	- Synthèse des évaluations socio-économiques des pistes - Prioritisation des travaux en programme annuel, report des travaux, travaux complémentaires et de renforcement	piste_evaluation_selection
Manuel de Transfert de Gérance des pistes	- Chronogramme de transfert de gérance - Projet de contrat type de maitrise d'ouvrage délégué - La constitution, le rôle et le fonctionnement du Comité de Conseil et de Suivi de la gérance des pistes - Reconnaissance de l'éligibilité de l'AUP comme structure d'entretien	piste_manuel_transfert_gerance
Les impacts de la réhabilitation des pistes dans les régions désenclavées	- Impacts économiques - Impacts sociaux	pistes_impacts

2.2 FCE RAILROAD AND PORT DE MANAKARA

Documents title/Titre des documents	Contents/Liste des points traités	File Name
Port de Manakara (Ray Lawler)	Evaluation of the Port's operation and recommendations to improve it	Port Manakara_evaluation
FCE Revue Stratégique (Alain Godeau)	Analyse et définition des actions stratégiques FCE : document qui a déclenché l'appui de CAP et autres partenaires	fce_revue strategique
FCE : Programme d'urgence (CAP)	- Synthèse des actions CAP à faire pour démontrer la viabilité de la FCE	fce_programme urgence

3. AGRIBUSINESS ANNEXES

Documents title/Titre des documents	Contents/Liste des points traités	File Name
Le séchage des fruits et légumes	- Technique de séchage - Matériels utilisés	ag_fruitseche

Propositions pour une amélioration de la production du géranium rosat dans la région de Fianarantsoa	- Diagnostic de la plantation de géranium	ag_geranium
Etude de faisabilité pour le développement et la promotion du vignoble de Madagascar	- Evaluation technique - Cépage - Parasites végétaux et animaux - Procédés de vinification - Produits connexes	ag_vignoble
FAMAMA : Memorandum d'informations pour la privatisation	- Contraintes techniques et administratives - Solution à court et à long terme - Étude juridique	ag_privatisation famama

4. VETIVER ANNEXES

VETIVER : HOW TO - TECHNICAL INFORMATION		
Documents title/Titre des documents	**Contents/Liste des points traités**	**File Name**
Le Vetiver - Une Haie contre l'Erosion	Vetiver: how to-technical information	v_hedge against erosion
Recommended Best Practice for Multiplying and Planting Vetiver to protect Roads, Cement works and embankments, and for uses in agriculture, agro-forestry and environment	Vetiver: how to-technical information	v_best practices.multiplying and planting
The Role of Vetiver Grass in Sustainable Agricultural Productivity	Vetiver: how to-technical information	v_in sustainable ag production
Renforcement de la stabilite des Pentes et Prevention d'Erosion par l'Utilisation du vetiver dans les travaux d'ingenierie	Vetiver: how to-technical information	v_stabilizing embank
Les Particularites du Vetiver	Vetiver: how to-technical information	v_particular
Sample Specification for Vetiver Contracts (English)	Vetiver: how to-technical information	v_specifications for planting
Fiche Technique/Technical Information sheet Vetiver (English)	Vetiver: how to-technical information	v_fiche technique
Effect of Grass Bunds on Erosion Loss and Yield of Rainfed Rice	Vetiver: how to-technical information	v_riceyield
VETIVER: EXPERIENCES ELSEWHERE		
Documents title/Titre des documents	**Contents/Liste des points traités**	**File Name**
Le Vetiver et l'Agriculture Ce que disent les utilisateurs de vetiver en Philippines	Vetiver: experiences elsewhere	v_comments by users in Philippines

Vetiver for Water Eutrophication Control in Taihu Lake of China	Vetiver: experiences elsewhere	v_lake purification China
Report on the Impact of Vetiver Grass Technology at the Ground and Water Bioengineering Conference, Manilla, Philippines April 1999	Vetiver: experiences elsewhere	v_TVN Manilla report
Vetiver Grass Technology for Land Stabilization, Erosion & Sediments Control in Asia Pacific Region	Vetiver: experiences elsewhere	v_VGTfor Bio Engineering Conf
Vetiver Grass Technology for Mine Tailing Rehab.	Vetiver: experiences elsewhere	V_VGT for tailings Rehab99
Application of Vetiver Eco-engineering for the Prevention of Highway slippage in South China	Vetiver: experiences elsewhere	v_Xia Manila Paper
Les Points importants du Congrès International sur le Reseau Vetiver en Fuzhou - Chine oct 97	Vetiver: experiences elsewhere	v_intl vetiver conference China 97
VETIVER: MADAGASCAR		
Documents title/Titre des documents	**Contents/Liste des points traités**	**File Name**
Vetiver Grass Technology: Potential Applications and Benefits in the Protection of the Environment, Agricultural Land & Infrastructure in MADAGASCAR	Vetiver: Madagascar	v_potential application in Mcar
Vétiver Fiche Technique	Fiche technique sur l'utilisation de vétiver	v_fiche technique sngf
Verobe ou Vétiver	Fiche technique sur l'utilisation de vétiver	v_fiche technique verobe
Le vétiver : Son application dans l'agriculture, l'ingénierie et l'environnement	- Practical guide to vétiver uses	v_ag environment and engeneering application
Liste des fournisseurs de vetiver, Mcar	Vetiver: Madagascar	v_supplier vetiver list
Vetiver Labels (a attacher sur les plants de vetiver en pot)	Vetiver Madagascar	v_vetiver labels
Vetiver: Installation de Pepinieres et Experimentation/ Mcar	Vetiver: Madagascar	v_pepiniere Mcar

5. CONTRACT TEMPLATES

Contrats-Type pour Vetiver		
Production de plants	Cadre du bordereau detail estimatif - Prix d'application (Production) - Recapitulation	v_template_production
Achat / livraison de plants	Cadre du bordereau detail estimatif - Prix d'approvisionnement - Prix d'application (Livraison) - Recapitulation	v_template_livraison
	Cahier des prescriptions spéciales : - Indications générales - Modalités d'exécution du marché - Dispositions financières et diverses	v_cps_marche
	Cahier des prescriptions spéciales : - Indications générales - Modalites d'exécution des travaux	v_cps_travaux
-	Cahier des prescriptions spéciales - Spécifications particulières - Provenance, qualité et préparation des matériaux - Mode d'exécution des travaux - Mode d'évaluation des travaux	v_cps_particulier
Environmental Screening Form	Cas d'études environnementales de la piste à Ikongo, le pont d'Ambinanitromby avant la réhabilitation. Formulaire utilisé pour obtenir l'approbation environnementale avant d'exécuter les travaux de réhabilitation	v_env.screening forms